EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

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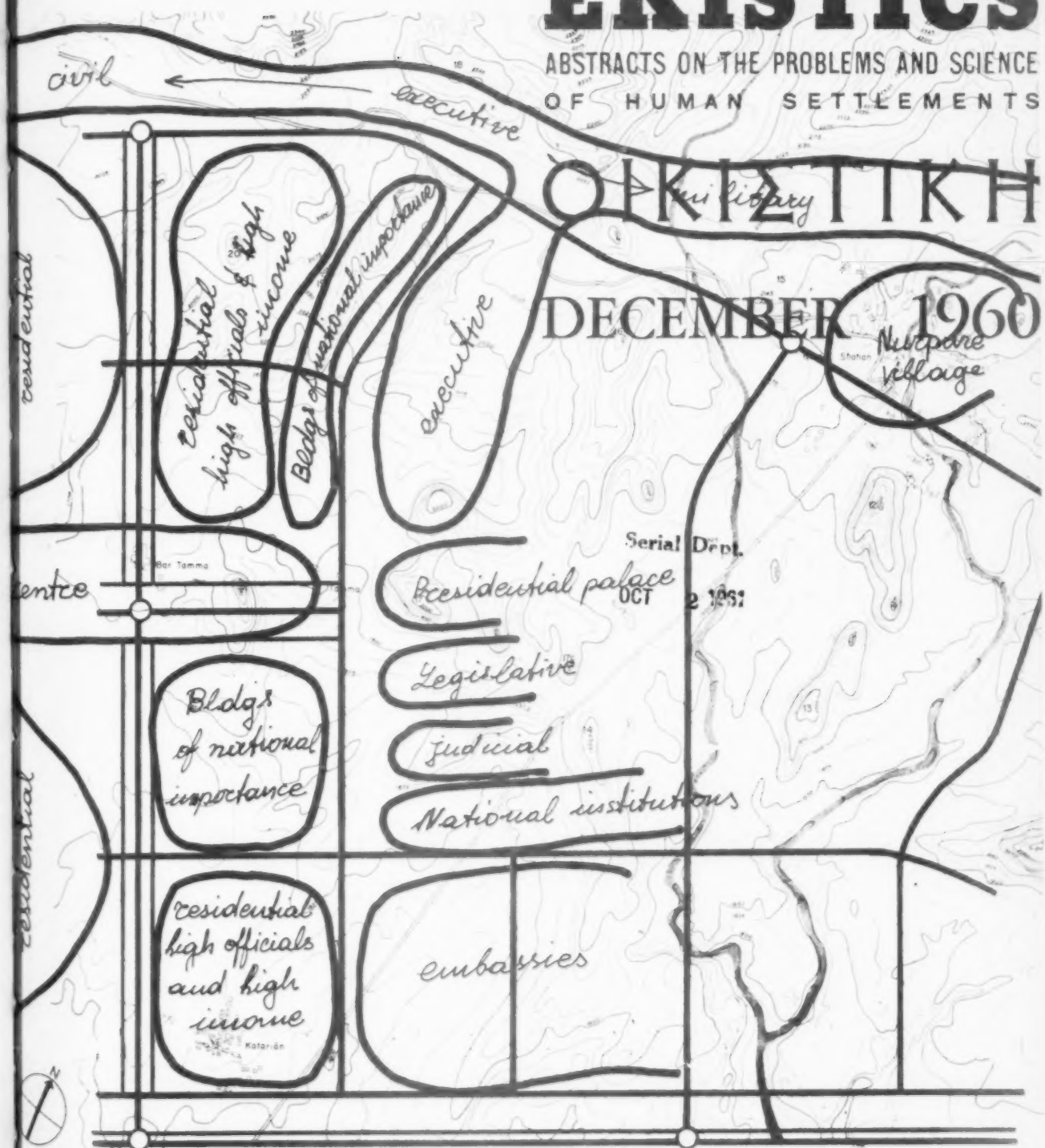

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E K I S T I C S

ABSTRACTS

of

THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

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DOXIADIS ASSOCIATES
Consulting Engineers
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Editor: Prof. J. Tyrwhitt, 20 A Prescott Street, Cambridge, Massachusetts, USA

Production Editor: Mr. J. Piperoglou, Doxiadis Assoc. 24, Strat. Syndesmou, Athens, Tel: 22.091

Cover Illustration: ISLAMABAD, INTERRELATION OF FUNCTIONS IN THE ADMINISTRATIVE CENTER

The main reason for which the new Capital of Pakistan is being created is that the proper environment should be provided for the administrative functions of the Country. The hills lying Northwest of Rawal Lake form an ideal setting for the administrative sector, at the core of the city of ISLAMABAD and at the end of the main axis. Thus, and on the basis of the theory and principles of the City of the Future--DYNAPOLIS--the administrative sector as well as the central sector of the city both begin at the core of ISLAMABAD. The Capitol complex will be at the heart of the synthesis. It is from here that the administrative sector will have to be developed towards and following the direction of the Margala Hills, in order to spread along them in the future. The sketch on this page is a Zoning Map of the Administrative Center of ISLAMABAD.

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EKISTICS is compiled by Mrs. Gwen Bell under the direction of Prof. J. Tyrwhitt.

All enquiries regarding the contents of EKISTICS to:
J. Tyrwhitt, 20 A Prescott Street, Cambridge 38, Massachusetts, U.S.A.

All enquiries regarding the distribution of EKISTICS to:
J. Piperoglou, Doxiadis Associates, 24 Strat. Syndesmou, Athens, Greece.

EDITORIAL

This number of EKISTICS, the last issue of volume 10, is mainly devoted to designs for houses and cities which do not outlive their lifespan within a single generation. For this houses must be timeless: they must eternally be able to meet the recurring human needs of man. And cities must be ageless: they must forever be able to grow and expand to meet the needs of an increasing population, without letting their raiment of buildings ever appear to hang loosely upon their shoulders or to become outworn, shabby and shrunken.

The first six articles deal with an age-old type of house, now reappearing as the height of fashion in every quarter of the globe: the patio house, the atrium house, the hypostyle house, the courtyard house, the house built around an enclosed garden. Our examples come from Switzerland, Denmark, USA, Scotland and Italy, with some reference to classic models. It is not difficult to understand that the inhabitants of the mediaeval city of Berne can find it agreeable to live in a dramatically dense settlement of row houses planted upon a wooded hillside. But it is surprising to find the home-ownership, car-minded population of Detroit enjoying living downtown in patio houses. There is a waiting list for tenants of these, though the neighbouring, less private, row houses are still difficult to rent.

Then come two articles on urban design: the first a description of the methods employed to wed good planning with good architecture in the city of Philadelphia, the second a description of a new university city in Pakistan. Both give evidence of the current preoccupation of welding the new with the old, of holding fast to the principles of contemporary architecture while avoiding casting slurs upon the achievements of the past, whether this be a heritage of earlier buildings, whose appearance and scale must be respected, or of traditional techniques or building materials which are equally worthy of respectful regard.

Some short notes follow on planning for comfort in hot dry and a hot damp climate and a deceptively simple article on programming construction procedures. Though this was written for use on building sites in Indonesia its lessons are widely applicable.

That elusive subject upon which so much is written, community development, has provoked an article by the director of the Hague Institute of Social Studies, which is succeeded by a concise resume of the present position of long term national plans in Asia and the Far East.

Regional planning, city planning and the motives and theories underlying forward looking action in these fields form the topics of the four remaining articles: all have in common the inter-relation of a city and its hinterland. The first deals with regional planning in Israel, the second with replanning the national capital of Indonesia, the third the organization of physical planning in

Philadelphia, the fourth--and by far the longest--methods of arriving at the plan for Islamabad, the new capital of Pakistan. In Israel the problem is to create a healthy interdependence between city and country which can bring both a richer life. In indonesia to stem immigration into Djakarta through active and integrated regional planning. In Philadelphia to revive recognition of urban values. The plan for Islamabad, the work of Doxiadis Associates with the Government of Pakistan, grows out of its regional setting. It is of course tempting to compare the approach taken for this capital of a country of 90 million people with the first plans for Brazilia (capital for a country of 49 million) and Chandigarh (capital of the 40 million inhabitants of the State of East Punjab). Da Costa, planner of Brazilia, proudly admits that he derived the master plan for this city from an arbitrary diagram, starting with a cross as man's simplest expression of taking possession of something. Le Corbusier derived his plan for Chandigarh from the site: from selecting the noblest possible position for the government complex and then concentrating upon the other end of the scale, the best living conditions that could be created within the means of the humblest of government workers who would be living there. These two factors were brought into relationship with one another by the application of a series of planning principles of which the two most important were first the scale of the residential units (half a mile by two-thirds of a mile or about 240 acres) with a population of 15-30,000 people) and second the clear definition and segregation of different kinds of road traffic: fast moving and uninterrupted, slow moving mixed traffic, residential access roads, pedestrian and cycle paths.

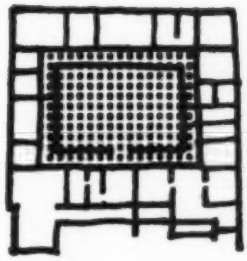
The outline plan for Islamabad is neither the outcome of an arbitrary diagram nor the application of a predetermined series of planning principles. It shows the orderly evolution of a plan from a close analysis of the actual conditions of the site and the economics underlying and dictating the early development of the city. However once the main guiding lines of the plan had been traced out by this process the application of principles begins. The residential units of Islamabad are square and slightly larger than at Chandigarh, each of their sides measuring almost two-thirds of a mile. But the chief planning principle employed is the dynamic use of the principle of linear growth to ensure that the natural growth of the city--including even the unanticipated and the unexpected--can be enabled to proceed in an orderly manner, never detracting from the beauty and dignity of the capital city either by cluttering it up or by competing with it. Dr. C. A. Doxiadis theoretic plan for a constantly growing city--Dynapolis--was described in EKISTICS . . . In this preliminary plan for Islamabad he shows how this principle could be put into operation, though the plan itself is still but a skeleton. The flesh and muscles of a full-fledged project with its raiment of buildings are not yet visible.

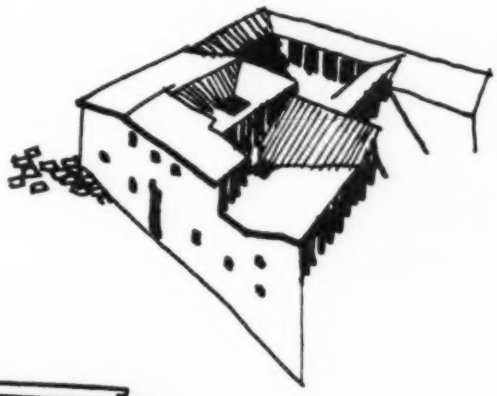
Abstracted from "Architecture and Building,"
April 1960, Pages 122-129.

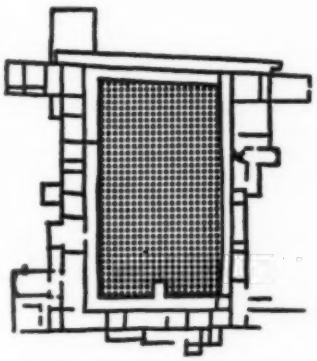
COURTYARD PLANNING

Roy Chamberlain

1. It is the purpose of this survey to state once more that high building is not the only method of effecting high density, and that there are ways of providing small private gardens in schemes with up to 170 people per acre.





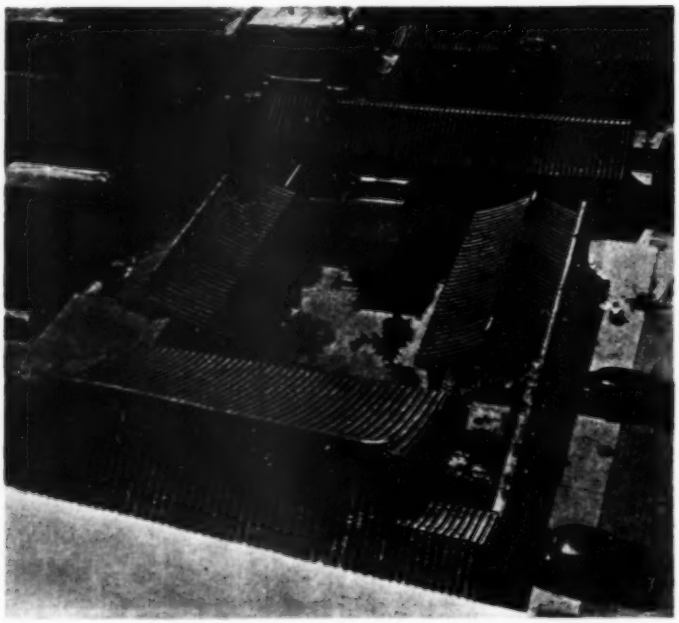


The two basic forms of the Romano-British house, the town house and the villa, were both inward looking, but evolved to meet different sets of conditions. The villas were generally profit-making forms, and represented the adoption of Roman standards, and the conversion of the corridor house into a courtyard house was dictated by the size of household and estate rather than by cultural considerations.

The town house was on a much smaller scale, and designed to exclude traffic noise, to create conditions of privacy and security and to make possible the siting of shops between the house and the street.

The housing pattern within the gridded street layout was not a closely built cellular form, as in the Gallo-Roman towns ; the houses were set within the insuli as separate units in haphazard fashion.

A typical small courtyard house in Peking. The courtyard house was well adapted to the needs of the Chinese family, in which sometimes several generations would live together. Different family units inhabited different parts of the courtyard, and a larger house would consist of several or many such courtyards.

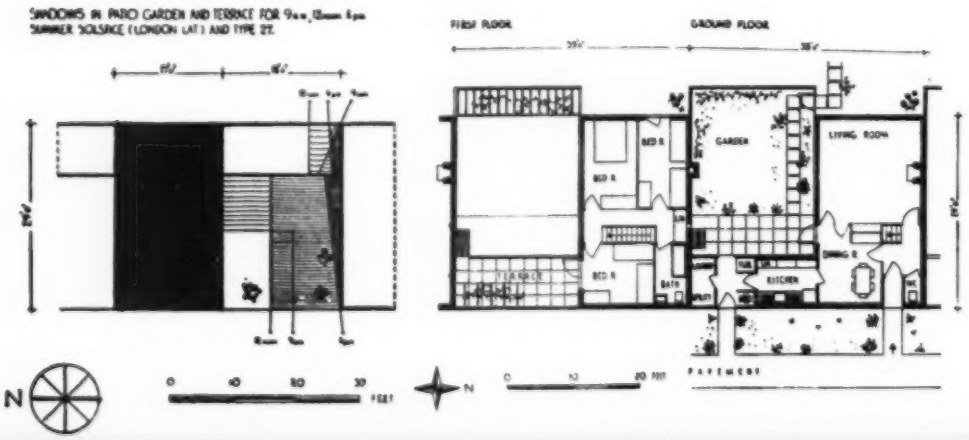


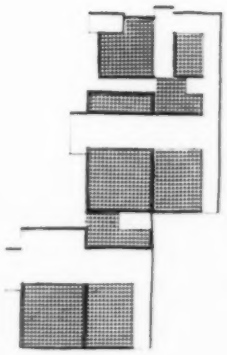
In "Home and Environment" 1948, W. Segal attempted to find a new definition for the relationship between house and garden. He recognised that the garden of the usual small house was a garden to work in to produce flowers and vegetables, but hardly designed "for that sort of leisure which is a privilege of every family and a strictly private one."

He developed a variety of house plans on the same basic theme of the terraced L-shape producing a garden enclosed on three sides, with the fourth screened, a garden overlooked by no other dwelling, and which could be used as an extension of the house.

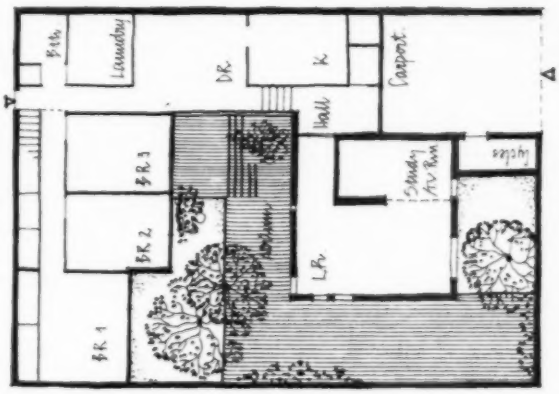
He indicates that with correct orientation the court can, in summer, be almost without shadow from 4 p.m. until sunset, when the normal family is likely to make the best use of it.

The open spaces about the house are conceived as a threefold sequence of : intimate gardens ; individual gardens outside the patio ; common greens. Densities achieved are not high, up to 17 houses per acre, for this is an attempt to establish special conditions for living.





The small group of court houses at the Interbau Exhibition, Berlin, by Edward Ludwig is interesting for the use of a "double-banked" system, with access to all dwellings from one side, through individual entrance/service courts.



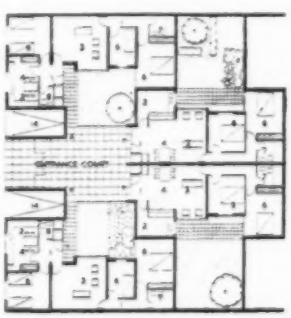
These atrium houses form part of a cluster within the Paradise Row scheme, Henley-on-Thames, architect Tom Hancock of Morton, Lupton.

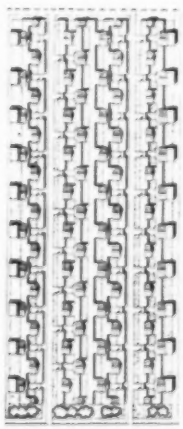
Each house is considered basically as a high walled garden with the dwelling built in a loose form within it, and there is no view into the courts or the houses from nearby high buildings. Footpath and car approaches are considered separately. (Above and left)

In their "Living Suburb" project, 1958, Chamberlin, Powell and Bon, G. Shankland and D. G. Jones use one and two storey court houses in carpet and stepped terrace forms. They consider that the objective of privacy "can be taken to excessive and rather unhealthy ends" and consequently many of the courts suffer from some degree of overlooking. If a court can be overlooked, it is no more useable as an outdoor living space than the garden of the typical suburban semi-detached house.

In the carpet layout, clusters of four dwellings are planned around a common entrance/service/play court, flanked by garages. Density, 90 persons per acre.

The terraced layout consists of similar groups around the entrance court, but two storey houses are entered at half landing level, and by varying the courtyard size the terraces are tailored to the fall of the ground.





The limitations of the courtyard form in this country are of course to a large extent dictated by climate, and it is difficult to isolate factors in schemes built in other countries which are independent of climate and social conditions.

The main considerations in detail planning of the dwelling unit are :

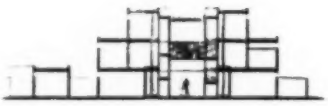
1. The placing, privacy and size of the internal courts, and the possibilities of separate service and garden courts ; (see New Town project p. 128). For minimum shadowing within the court it is best orientated E-W on the long axis. Walter Segal recommends that the relationship of width of patio to height of house should not be more than 45 deg., resulting in a width of about 18 ft. 6 in. in two-storey development. With sun entry over single-storey building, this is reduced, but a garden court size of about 25 ft. × 16 ft. seems to be the desirable minimum.

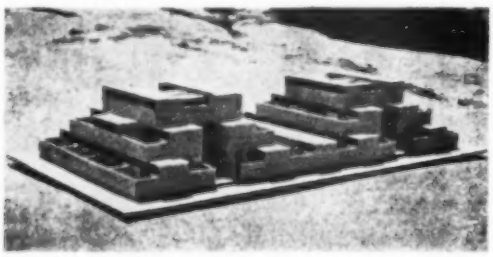
2. The placing of social and service entries to the building, and the possibility of secondary pedestrian access in certain types of layout ; see Paradise Row, Henley.

3. The grouping of service cores of adjacent dwellings to achieve economy in drainage runs and services, and possibilities of pre-formed plumbing ; see Persian Gulf housing.

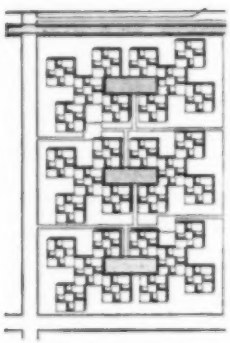
4. The planning of the unit in relation to contiguous dwellings to maintain cross-ventilation, and to restrict noise transmittance.

5. The flexibility of the unit for grouping on flat or sloping sites, and in varying forms of layout.





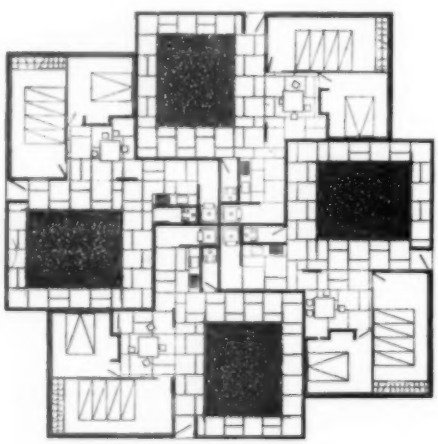
In their State housing project for the outskirts of Casablanca, where the rapid growth of shack towns is a serious problem, J. Hentsch and A. Studer attempt very high density by an ingenious, three-step ziggurat form, with privacy, shade and air circulation all carefully contrived.

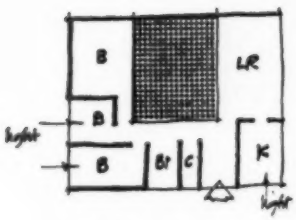


Housing in the Persian Gulf for petrol refinery personnel. Architects : Candilis, Brunache, Dony.

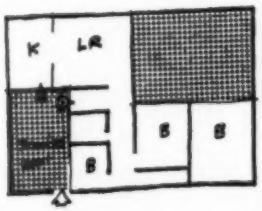
These dwellings are designed for economy, use of pre-formed elements, and flexibility in grouping. The basic unit is a cluster of four dwellings with the service cores grouped in the centre, thus creating an important concept of economy in plumbing runs and the possibility of pre-fabrication in the horizontal plane (an already established principle in the vertical plane in high building).

The possibilities of grouping and avoidance of monotony in the general layout are endless.



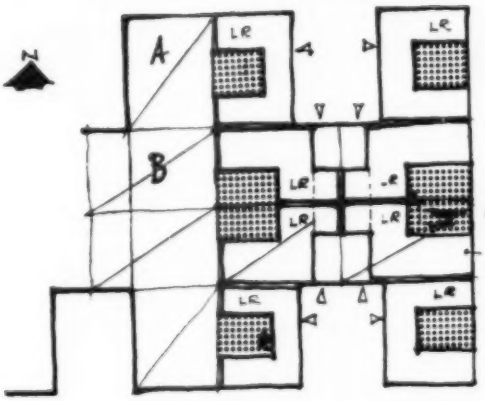


Plan A



Plan B.

Plan C (below)



Whilst a single courtyard house can be built in its own garden, the form is only completely rational when applied to group housing, unless, like the Paradise Row houses, the garden is a high walled involuted space, and the house a loose form within it.

The possibilities of grouping are endless, but generally they are limited by the detail planning of the house unit in the following ways :

If a single storey house is designed to enclose three sides of a court, light must be gained from one or more external faces (see Plan A) unless there is recourse to clerestory or top lighting. Thus the unit can be contiguous with others on perhaps only two sides, and there is possibility of back to back arrangement, but not of " double banking." This can be achieved by the introduction of a service court (see Plan B) so that all daylighting is obtained within the plot limits and the house can be enclosed on $3\frac{1}{2}$ sides. A combination of both types in four-deep terrace form is shown at C.

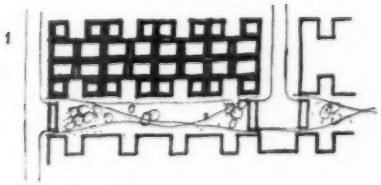
The introduction of an upper floor enables greater flexibility in ground floor planning, but it is difficult to avoid overlooking adjacent courts in tight layouts (see " Living Suburb " scheme), unless some form of screening at first floor level is possible.

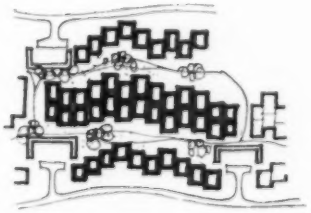
The highest densities are achieved with the " carpet " form of layout where there is no common open space within the housing mass. If, however, external spaces are to be introduced, the possible arrangements are variations of three basic groupings.

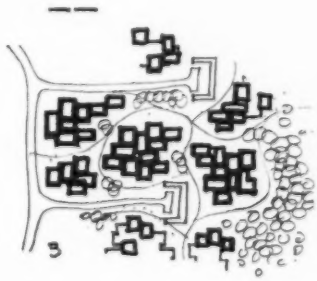
a. The rigid geometrical terrace form, single, double or quadruple banked (see 1).

b. The informal terrace (2) where the inherent flexibility of the court house is utilised, creating more interesting pedestrian spaces.

c. The " nucleated " form (3) with clusters of houses set freely in the landscape.







Abstracted from "Architectural Design"
Volume XXX, Number 9, September 1960
Pages 245-246

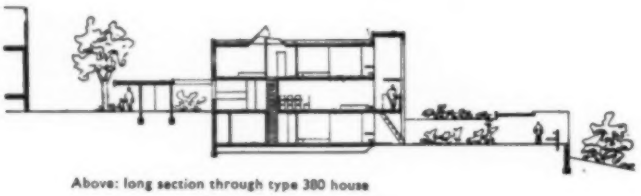
SIEDLUNG HALEN, BERNE, SWITZERLAND

Atelier 5

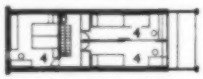
1. The site, about 3 miles from Berne centre, slopes steeply to the south. There are 33 large and 41 small one-family houses and 5 studios. Each house has a private garden on the south side. In the centre of the scheme is a café, shop and communal heating plant.

2. Motor access from the main road terminates in a parking square and garage; from here the access routes and village square are for pedestrians, who can reach their houses by covered ways.

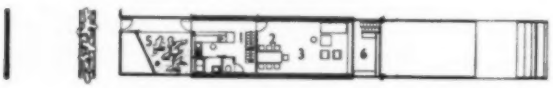
3. The houses are all three storey, using the slope of the ground to enter at the middle level. The lower floors have a walled garden and covered terrace; projected party walls give privacy. Both house types, one with a cross stair, the other with the stair parallel to the party walls, offer the same basic accommodation, a maximum of seven rooms, within the 16 ft. 6 in. x 48 ft. outline or 12 ft. 6 in. x 46 ft. 6 in. outline, but several variations in the upper and lower levels are available.



Above: long section through type 380 house

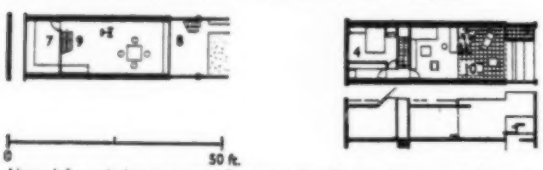


Above: second floor plan. *Key:* 4 bedrooms



Above: entrance (first) floor plan. *Key:* 1 *kitchen* 2 *dining* 3 *living* 5 *patio* 6 *balcony*

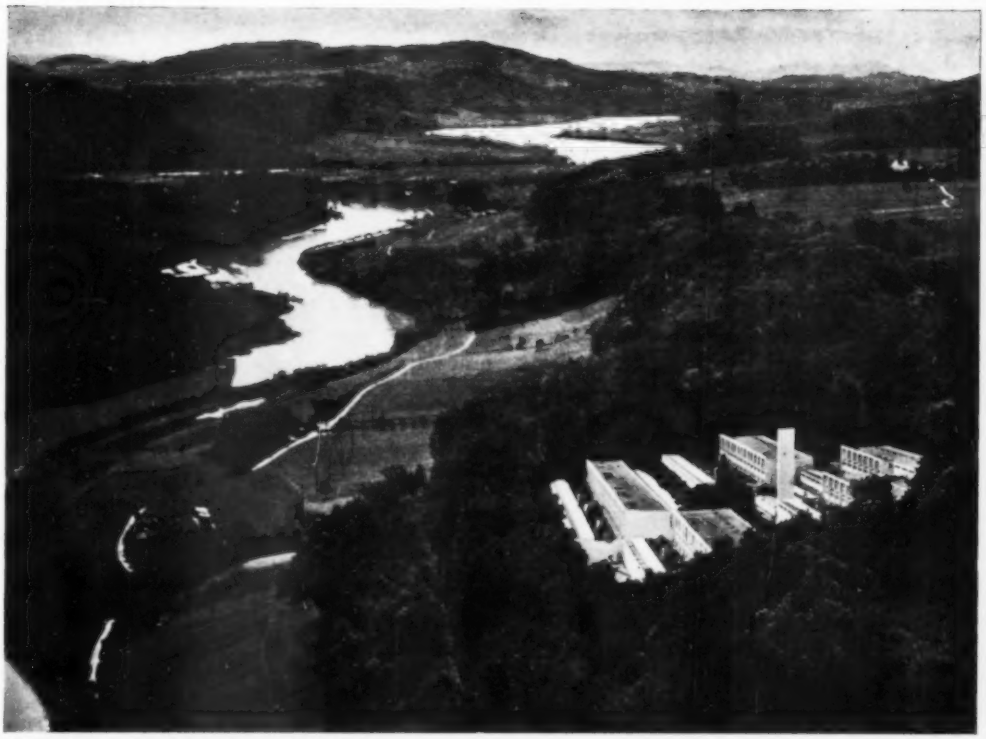
Above: ground floor plan. *Key:* 4 bedroom 7 store 8 covered terrace



Above left: variation on ground floor plan. *Key:* 7 store 8 terrace 9 playroom

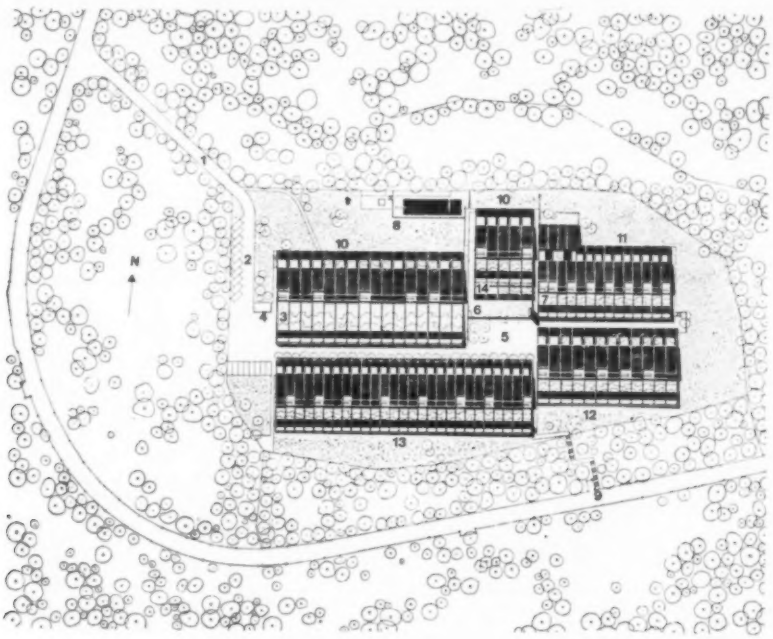
Above right: variation on second floor plan, with section. *Key:* 4 bedroom 10 sunterrace

These plans are for type 380 house. The type 12 house is very similar, but larger, with a 16ft. 6in. frontage, and with the stair parallel to the party walls



Above: photo montage of the model into the landscape

Below: site layout. *Key:* **1** *access road* **2** *parking* **3** *central garage under gardens* **4** *filling station* **5** *main square* **6** *shops and café, with terrace over* **7** *central heating plant, laundry, etc., under gardens* **8** *swimming bath* **9** *pedestrian access from south* **10** *upper houses type 12 (16ft. 6in. wide, seven rooms. Show house photos opposite page)* **11** *upper houses type 380 (12ft. 6in. wide, seven rooms, plans, shown opposite, similar to type 12)* **12** *lower houses type 12* **13** *lower houses type 380* **14** *studios*

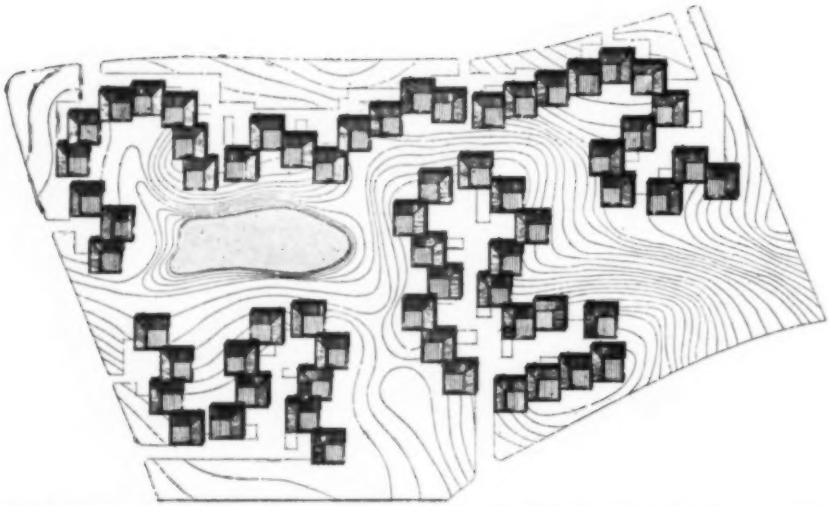


Abstracted from "Architectural Design"
Volume XXX, Number 9, September 1960
Pages 247-248.

COURT HOUSES AT ELSINORE, DENMARK

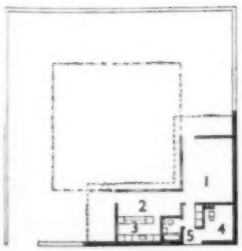
Jørn Utzon

1. The court house is a square unit where the dwelling occupies two adjacent sides of the square, whilst the two other sides are screened by walls. The screen walls are so designed that there are pleasant views to the surrounding parkland from the individual courtyard gardens. The court house unit offers excellent possibilities as a building element. A chain of such houses can be flexibly adapted to undulating ground, and can absorb both vertical and horizontal stagger. As the building sites proper are small, it is economically possible to provide large areas of common parkland. Owing to this, the court house can be used for the creation of typical neighbourhood units, precincts, market squares, open spaces and enclosed courts. On this site 60 court houses were erected. If conventional one-family bungalows had been erected on the same area there would only have been space for 48. The same material, yellow brick, has been used throughout. The variety of plans allows for almost any size dwelling, and a few shops have been included.

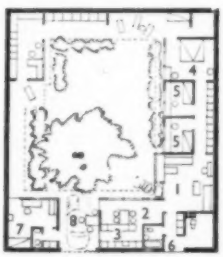


Above: site layout. The houses are served from a perimeter road with cul-de-sac access. The close packing of the units allows for a great deal of common parkland, including a small lake

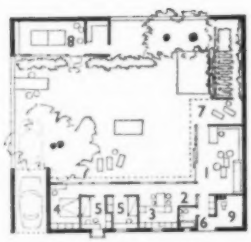
Above and below: the courtyard of a typical house



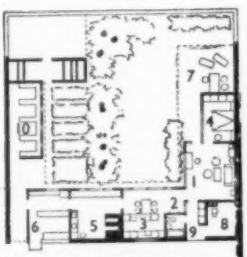
Above: minimum unit plan. *Key:* 1 *living* 2 *dining* 3 *kitchen* 4 *cycle store and boiler room* 5 *entrance*



Above: three bedrooms with separate flat. *Key:* 1 *living* 2 *dining* 3 *kitchen* 4 *main bedroom* 5 *children's bedroom* 6 *entrance* 7 *guest quarters or rooms to let* 8 *outdoor dining or carport*



Above: three bedrooms with games room. *Key:* 1 *living* 2 *dining* 3 *kitchen* 4 *main bedroom* 5 *children's bedroom* 6 *entrance* 7 *outdoor terrace* 8 *games room and store* 9 *cycle store and boiler room*



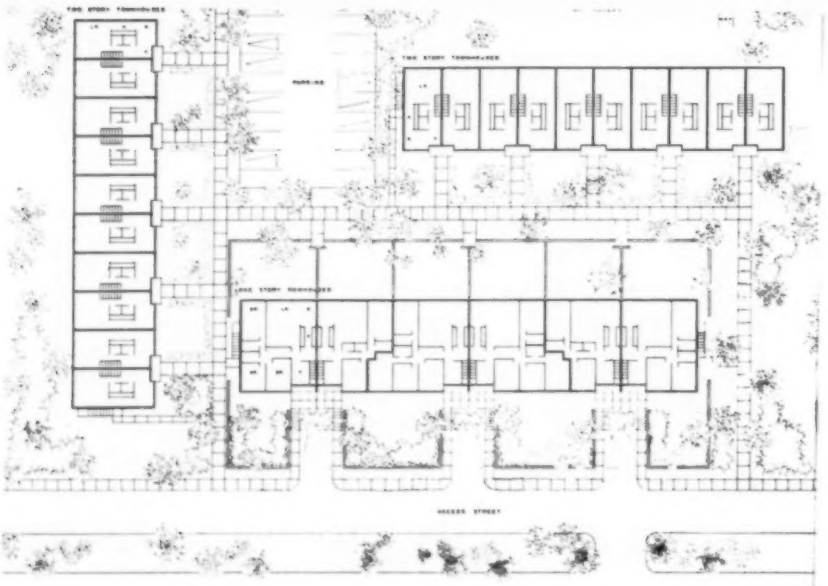
Above: house with baker's shop. *Key:* 1 *living* 2 *dining* 3 *kitchen* 4 *main bedroom* 5 *bakery* 6 *shop* 7 *outdoor terrace* 8 *cycle store and central heating* 9 *entrance* 10 *store*

Abstracted from "Architectural Design"
Volume XXX, Number 9, September 1960
Pages 253-254.

LAFAYETTE PARK, DETROIT, USA

Mies van der Rohe

1. This is a new neighbourhood being created half a mile from the centre of the business district. The 78-acre site includes a central 27-acre park with schools and playgrounds and a variety of two-storey row houses, single-storey patio houses and twenty-one-storey slab blocks. The plan and illustration below show a complex of patio houses and two-storey row houses.

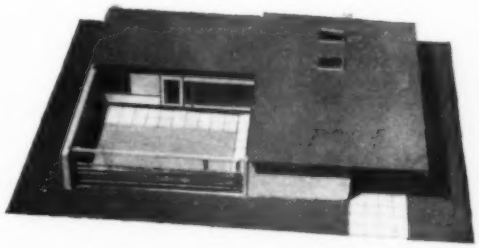


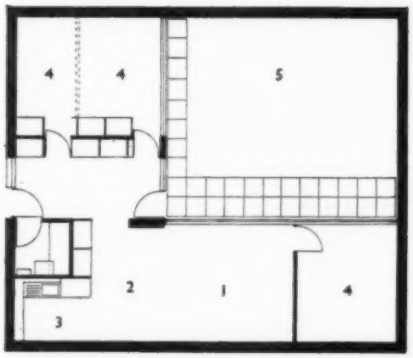
Abstracted from " Architectural Design"
Volume XXX, Number 9, September 1960
Page 351.

PRESTONPANS DEVELOPMENT

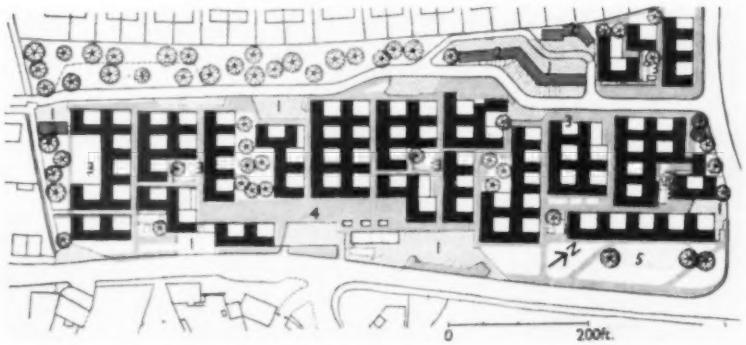
Edinburgh University Housing Research Unit

1. The site of Prestonpans development is approximately 10 miles south-east of Edinburgh. In all 90 houses are to be built in this project. The area of the site is 7.26 acres; density: 21.4 houses per acre: number of persons: 88 per acre. It is hoped to build some shops, in addition to communal services such as a launderette and playgrounds. Access to the houses is by covered ways which are for pedestrian use only, but which will be wide enough to take a vehicle if necessary.





Above: model of one house and access road. Variety is obtained by interrupting the covered streets by public courtyards
Right: plan of a typical unit. Key: 1 *living* 2 *dining* 3 *kitchen* 4 *bedroom* 5 *court*

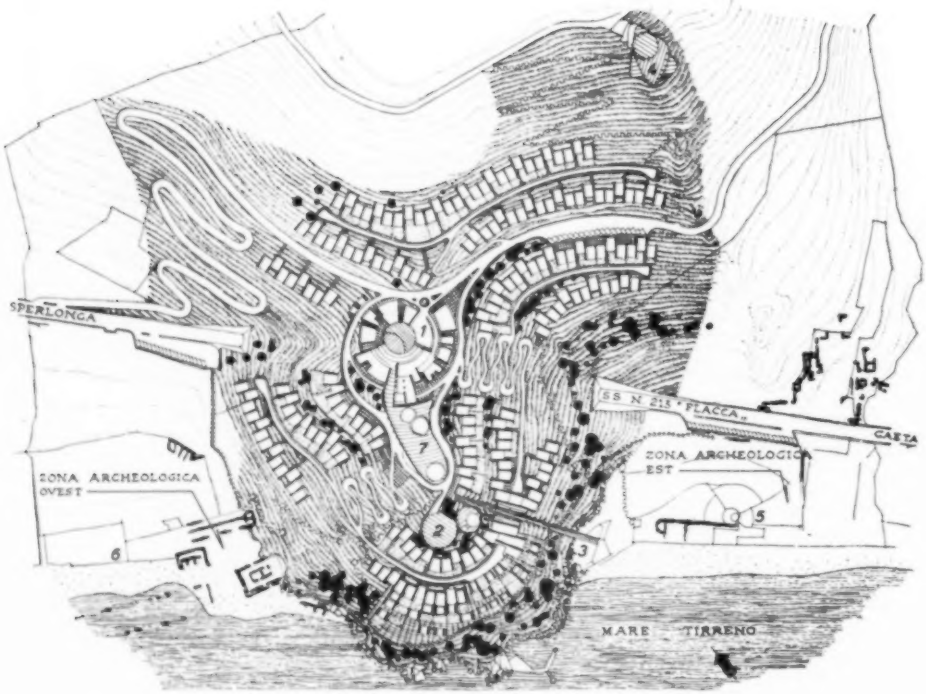


Abstracted from L'Architettura,
September 1960. Pages 316-317

LA "ROCCA DI TIBERIO" A SPERLONGA

Erna Bellante and Antonio Di Carlo

1. This plan for a residential village in an area between Rome and Naples is developed following the contours of a hill. On the hilltop is a complex of prefabricated low buildings and the community center.



Leggenda della planimetria: 1, Centro civico; 2, Terrazza belvedere con piscina; 3, Cremagliera; 4, Albergo; 5, Teatro all'aperto; 6, Museo archeologico; 7, Garage con stazione di servizio.

Abstracted from "Journal of the American Institute of Planners" Vol. XXVI, No. 3, August 1960. Pages 224-235.

A CASE STUDY IN URBAN DESIGN

Edmund N. Bacon

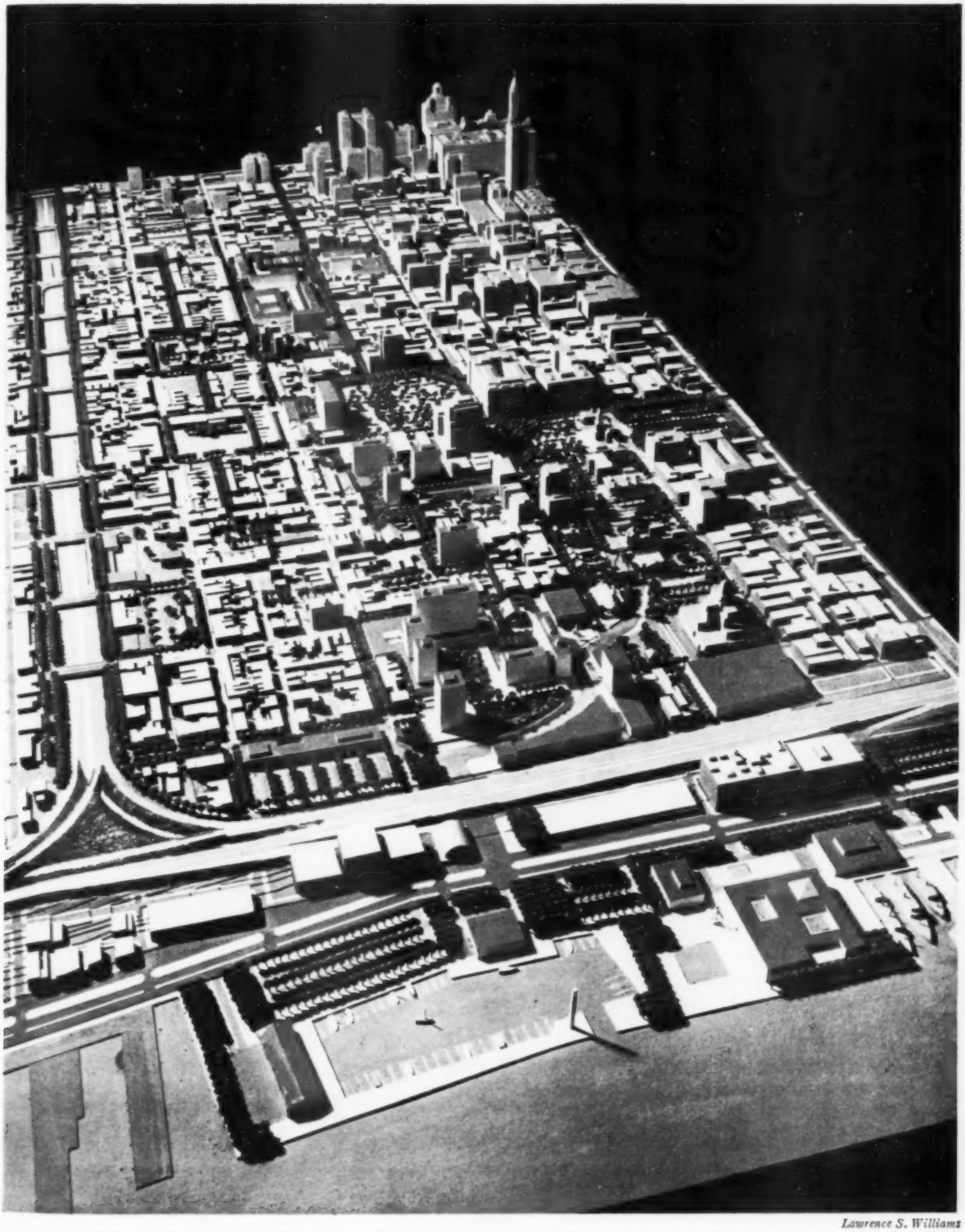
1. Edmund N. Bacon is Executive Director of the Philadelphia City Planning Commission, and prior to 1943 he served with the Philadelphia Housing Association. He was a participant of the Harvard Urban Design Conference, April 25, 1959, in which this case study was presented and discussed. The proceedings of this conference were abstracted in EKISTICS, August, 1959, Vol. 8, No. 46, pages 112-129. In this last September's EKISTICS the Eastwick Redevelopment Plan for Philadelphia prepared by Doxiadis Associates was presented for another area of the city.

2. The making of a redevelopment plan for a significant area of a city is an entirely different problem from that of designing a building or a group of buildings, and also from that of planning a comprehensive system of land uses or zoning or density standards. It is here that a new technical field is developing, the designed, functional three-dimensional organization of space into a significant expression of urban structure. Here is a field not now normally comprehended in either architecture or planning, in which lies the most potentially vital expression of each.

3. Although we in Philadelphia are in the beginning stages of a full understanding of the power and meaning of this form of planning, we have already seen the tremendous force it can become. Not only is it effective in welding together the work of many architects into one unified whole, not only is it capable of revealing economic potentials not previously evident, but also it can become of itself one of the most powerful instruments for the achievement of planning objectives. It can stir the public imagination and open up vistas of possibilities that no verbal exhortation could ever achieve. It can reverse trends and change projections forecast by statistics.

4. The deep understanding and skillful employment of three-dimensional design concepts is becoming increasingly a key element in the planning process. We are only at the beginning of its full utilization, but we hope that this case study of its part in the development of Washington Square East in Philadelphia will be of use to other cities.

5. The Washington Square East Project is a residential redevelopment of the historic section of Center City lying east and south of Independence Hall. It involves the removal of the wholesale produce market from the area, the provision of new multistory apartment towers and two- and three-story town houses, and the rehabilitation and restoration of eighteenth-century and early nineteenth-century houses. The prime objectives were to bolster the Center City economy by providing good housing for office



Lawrence S. Williams

FIGURE 4. (1957) MODEL PREPARED BY CONSULTANT ARCHITECTS, VINCENT KLING, ROY F. LARSON AND OSKAR STONOROV, showing proposed development of Old City Area. The Delaware Expressway is conspicuous along the waterfront, connecting with the Crosstown Expressway, which marks the southern boundary of Washington Square East. The greenway system links the principal historical monuments.

workers and executives, and to assure the preservation of the historic section of the city by restoring living values to the area. The problem of relating the new work to the old presented a special challenge to urban design.

6. A bidding document was prepared by the Redevelopment Authority. Five major corporate groups submitted bids to become redevelopers for the area. Out of this competition came the selection of two developers to carry forward the project, one in each of the two major parts of the area.

7. There are still many problems to be solved before construction can actually begin, but the competition has been a success up to this point, as far as urban design is concerned. The ten conditions which I consider to be the most important as contributory to this result are these:

a. A long-term community education program, in which design played a major part.

b. A high level of design talent and design motivation in the staff of the Planning Commission.

c. An effective working relationship between the Planning Commission, the Redevelopment Authority, and high-caliber private consulting architects.

d. A strong and explicit directive for the competition in the form of a large-scale site plan and model.

e. The attraction of high-quality developers in an atmosphere where design counts.

f. Employment by developers of high-caliber architects to design submissions.

g. Keen interest in the competition by top level community leaders who appreciate the value of design.

h. Strong and competent guidance by the Planning Commission in the evaluation of the design aspects of the submissions.

i. Capacity on the part of the community to make objective judgments.

j. Follow-through by the official agencies to see that good design is carried out.

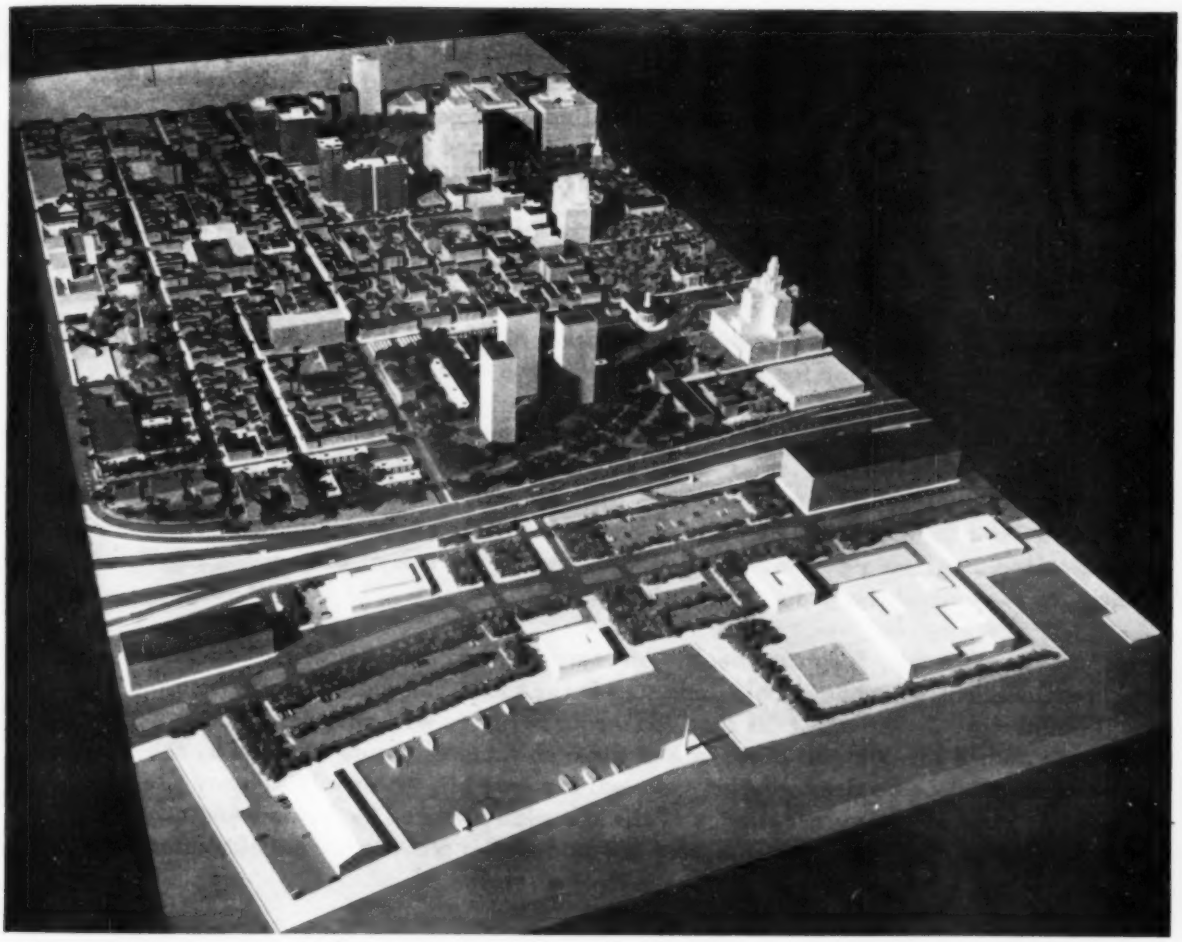


FIGURE 8. (1958) PHOTOGRAPH OF MODEL (in foreground, design prepared by I. M. Pei for Webb and Knapp for new development of wholesale produce area)

FIGURE 11. (1958) RENDERING OF WEBB AND KNAPP PROPOSAL, showing blend of old and new structures

8. Was it desirable to have so many different architects re-do the plan at the various stages? I would answer this question with an emphatic "Yes" in this case. Each "go round" by a different architectural group resulted in a substantial improvement in the preceding plan. The Kling, Larson, Stonorov plan was a marked advance over the 1947 plan in all respects. The Andrade plan simplified the massing of the tall buildings designated earlier into 6 thirty-story apartment towers and 3 six-story apartment buildings, making a quieter and more harmonious over-all composition. (See Figures 4 and 5)

9. The Pei plan prepared for Zeckendorf made still further improvement in the Andrade plan by eliminating entirely the six-story apartment buildings, and substituting three-story town houses for them, the additional units being provided by an enlarged plan for the towers. This simplification, plus the sensitive placing of the buildings, provided the key for the design selected for the eastern half of the area. (Figure 8)

10. Did the development of the detailed, large-scale site plan in advance of the competition inhibit the developers' architects in the preparation of their submissions? Here I would say emphatically "No." In this contention I am supported by the findings of the Harvard Design Conference which concluded that, far from being an inhibition, the detailed plans were a help. The freshness and differences of each of the submissions testify to the correctness of this conclusion.

11. One might ask, "With so specific an indication of what the official agencies wanted, why not just copy it cold, and submit the same thing back thereby assuring that you would win?" The answer is that you would not have won on a design basis because, for each part of the over-all plan, one of the architectural groups engaged by the developers produced a finer solution than was presented in the official agency site plan. However, it was the very excellence of the site plan prepared by Preston Andrade, and the definiteness and strength of the over-all guidance it provided, that stimulated the developer and his architects to achieve such fine results.

12. I think it is worthy of note that each of the developers has said that the detailed site plan was an assistance rather than an inhibition to him, and that the complex interweaving of the old and the new, a complicating factor in terms of procedure, actually strengthened and improved the project.

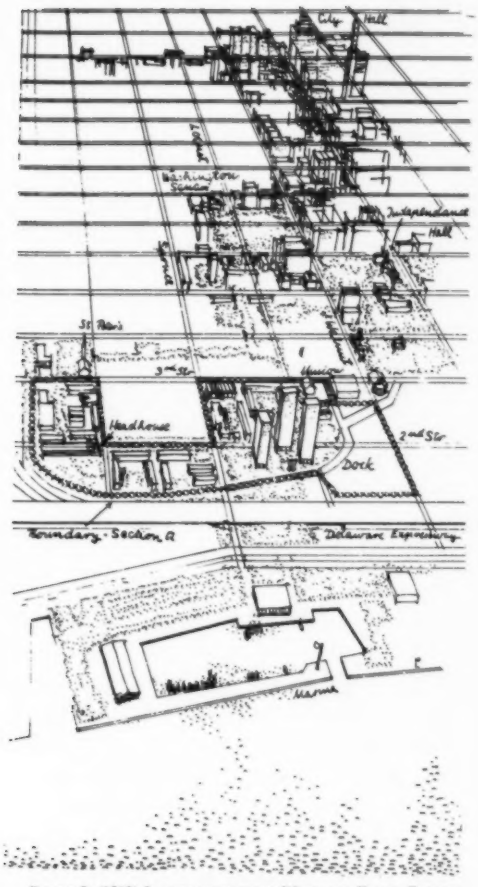


FIGURE 9. (1958) ILLUSTRATION FROM WEBB AND KNAPP REPORT, showing relationship of their design to the structure of Center City

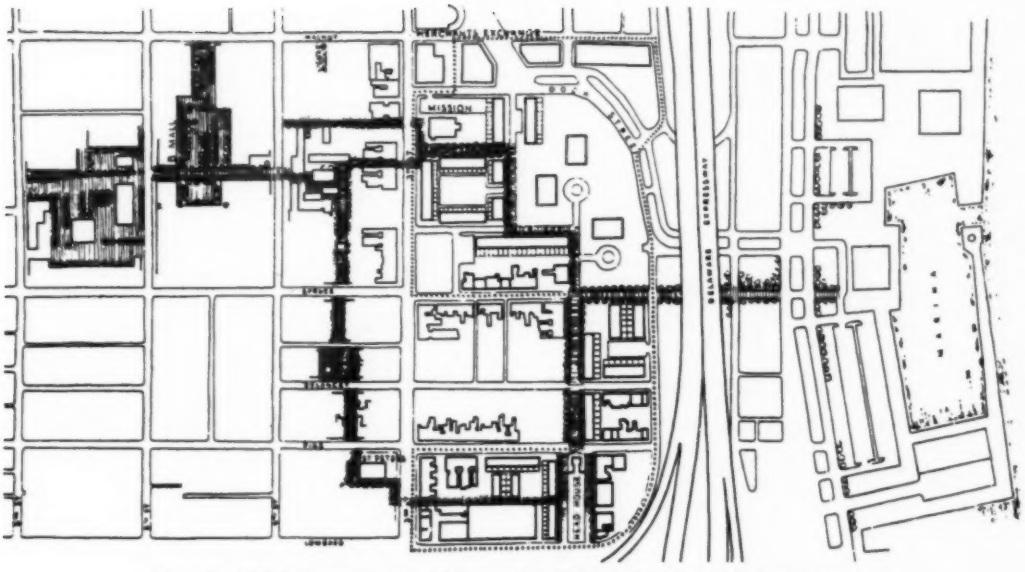


FIGURE 10. (1958) ILLUSTRATION FROM WEBB AND KNAPP REPORT, showing further development of the greenway system and its use as an organizing factor in the design

baukunst und werkform, July 1960.
Pages 361-385. Illustrations.

A UNIVERSITY CITY IN WEST PAKISTAN

Richard Döcker

1. Richard Döcker is a Professor of Architecture at Stuttgart. In 1955 he was commissioned to plan and supervise the building of a new city in West Pakistan to contain a university and every other type of institution for higher education to serve the Moslem world. Since his preliminary sketch plan made in 1956, few of the basic policies have changed and the city is being built.

2. The Need for a City. Today Pakistan is almost without industry or schools. Nearly 95% of the population is illiterate. To feed and educate its people, to expand its industry, to export and import, it needs trained minds - hence the idea of a new city containing, besides a university, colleges of agriculture, fishery, economics, engineering, art, architecture, and music, teaching hospitals and a teacher-training college with model schools.

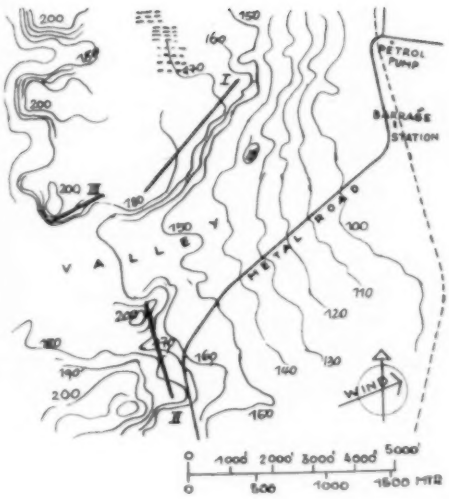
3. Besides housing for staff and students, the city needs a railway station, an airfield, hotels, restaurants, shops, a bank, a bus station, a fire station, an administration building, water and electricity works, assembly halls, cinemas, possibly a theatre, and sports grounds and stadium, to name only the non-university buildings most necessary to the life of the community. There will be no factories. The population will be about 35,000 including 10,000 students.

4. The Site for the City. The site is north of Karachi, 4 to 5 miles from the old city of Hyderabad and 3 miles west of the River Indus. It is about 25 square miles. The contours are interesting, with a plateau on the west rising sharply from land that falls gently towards the Indus on the East.

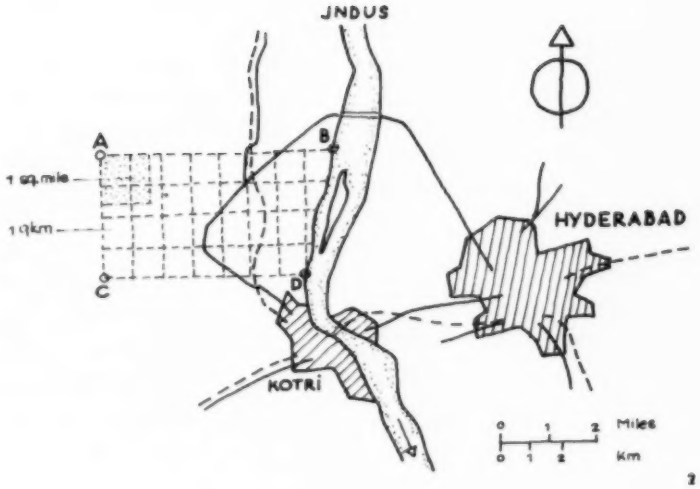
5. The Plan. The city has not been planned on a grid pattern, nor divided into rectangular use areas; the plan is neither a mere division of the land into building sites nor an exercise in ornamental design. The plan was governed by the nature of the site, the need for shade, and the direction of the wind. It is a free functional composition.

6. The university and college buildings stand on the plateau, mainly long one- or two-storey blocks emphasizing the contours of the site. Roughly at the centre of the arc is the academic core - administrative offices, mosque, library, museum, assembly hall - beside an artificial lake. In an outer arc lie the student hostels, each with its small mosque and related to its particular teaching building.

7. The remainder of the city is in the plain, in the hollow of the crescent. As near as possible to the teaching buildings are the houses for the staff, adjoining these the


PETROL PUMP
BARRAGE STATION
METAL ROAD
VALLEY
WIND
1000' 2000' 3000' 4000' 5000'
500 1000 1500 MTR

1


INDUS
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1 sq.mile
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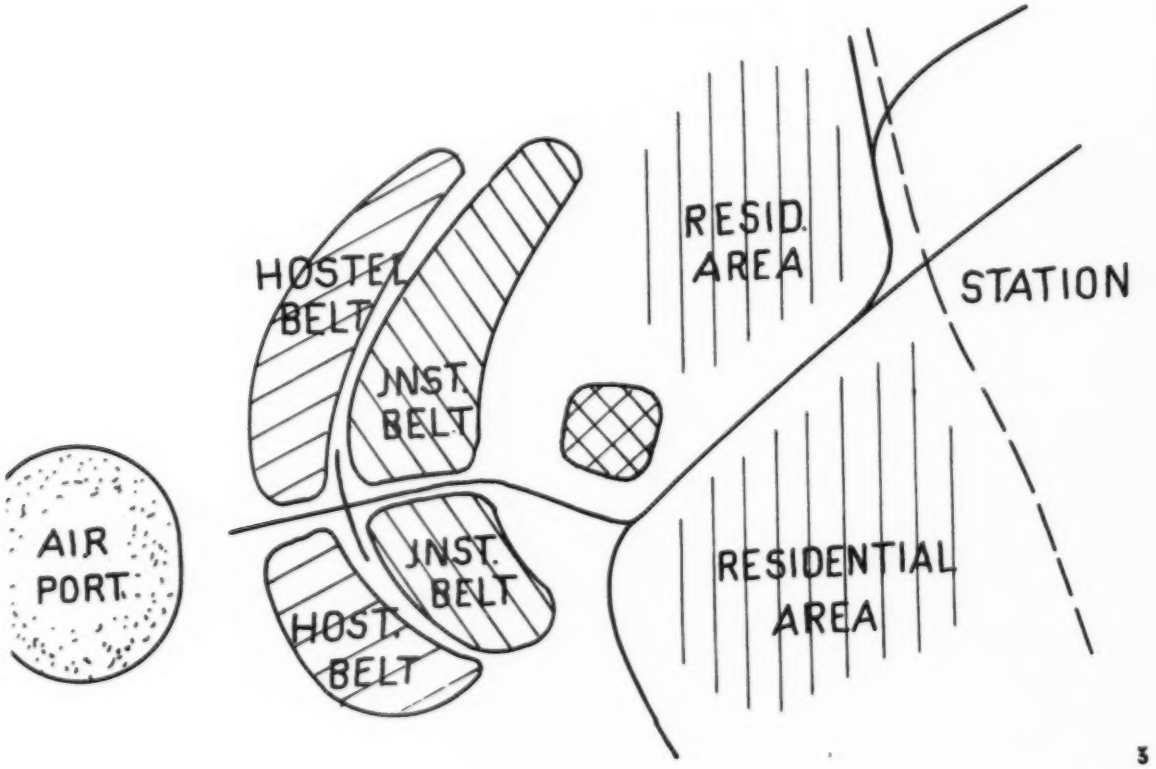

HOSTEL BELT
INST. BELT
RESID. AREA
STATION
AIR PORT
INST. BELT
HOST. BELT
RESIDENTIAL AREA

3

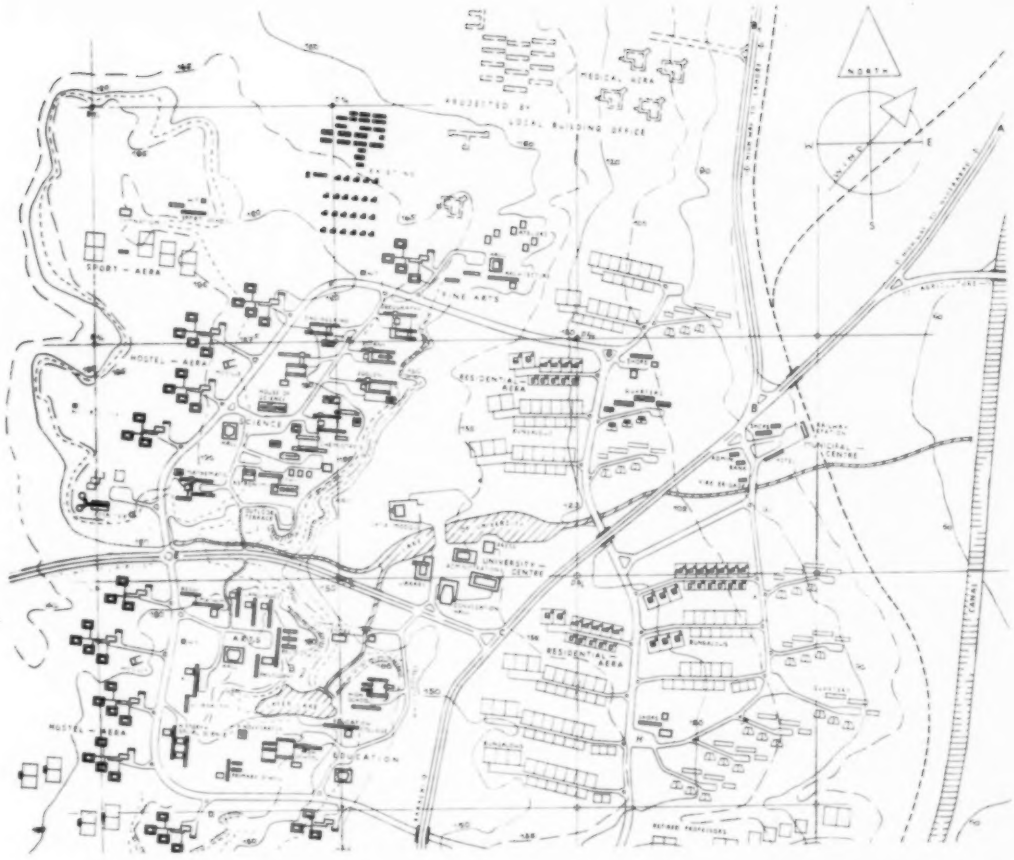
shopping centres, then smaller dwellings for the rest of the population, and lastly the the railway station with hotels, post office, bank, local administration building, police station, etc. Further out are the stadium and various sports grounds. On the west, out in the desert at the necessary distance from the city, is the airport with repair shops and flying school. The hospital precinct is in the extreme north.

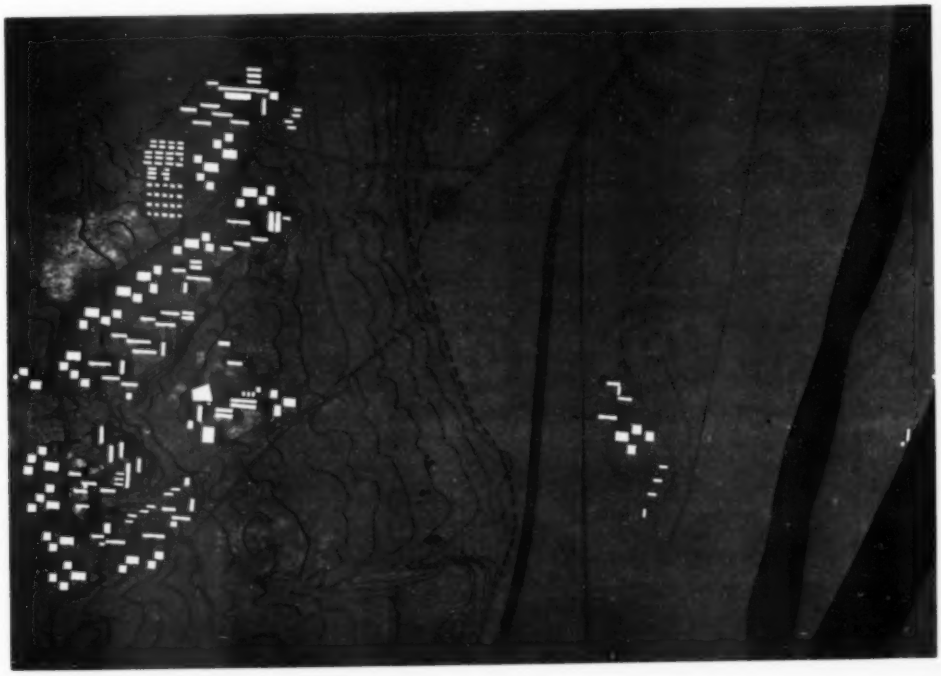
8. Communication. The scale of a city is all-important to its inhabitants. New planning too often ignores this. Here the vast scale of the landscape was particularly seductive, so distances were consciously kept down. The principal roads are a ring, an existing trunk road that at present cuts through the city and may later be rerouted, and a diagonal road serving and articulating the business and residential quarters.

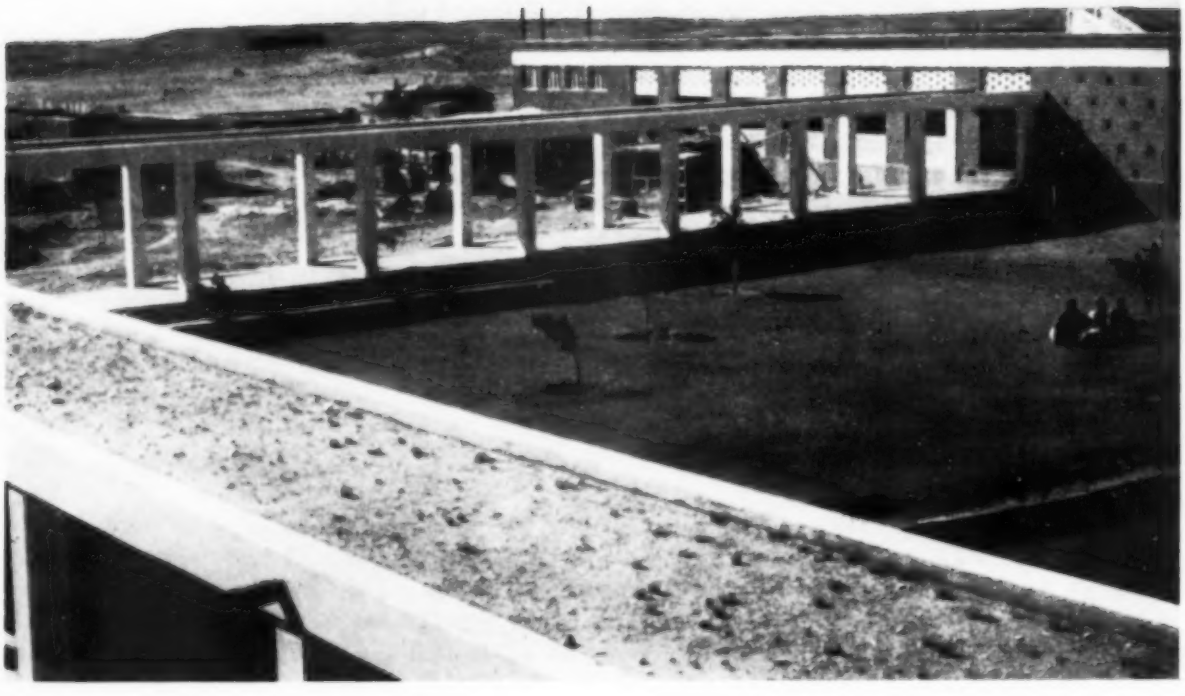
9. Construction. The academic buildings crowning the plateau and forming a new silhouette in the landscape, surrounded by a swarm of small buildings, will form a fitting contrast to the silhouette of the old city of Hyderabad across the plain. I agreed to limit the buildings to one or two storeys, since there was no lack of space and it would make construction simpler and, by saving scaffolding, cheaper. They are grouped, often round courtyards, so as to shade one another, and so placed as to make the best use of the refreshing wind.

10. Available building material is very limited: only sand, cement, concrete blocks and sandstone, found under the desert sand 12 miles from the site. There are no bricks of good enough quality. Bricks are still made exclusively by hand in Pakistan, and there is a shortage of fuel for kilns. Timber for windows and doors is expensive: it has to be brought from the forests at the foot of the Himalayas. Everything else, including metal sections and fittings, glass, and electrical and sanitary fittings, must be bought from abroad. There is a shortage of skilled workmen; tools and equipment are scarce; there is not even water on the site - so far it has been carried by motor vehicle from the Indus.

11. The Progress of the City. The first buildings were begun in the middle of 1957. In August of that year at a foundation stone ceremony I planted the first small mango, one of the first installment of 10,000 trees. One third of these will not survive. The money flows slowly and now and again dries up; it may be 20 years or more before the city is completed--if ever.


NORTH
MEDICAL AREA
SPORT - AREA
FINE ARTS
HOSTEL - AREA
RESIDENTIAL AREA
UNIVERSITY CENTRE
EDUCATION





3. A student hostel showing the connecting covered ways.

4. Dwellings for clerks and labourers.

Abstract from "Technion"
Bulletin No. 73-74

THE NATURE AND APPLICATION OF THE THERMAL INDICES

B. Givoni

1. Thermal indices (also known as comfort indices) are criteria used for mathematical or nomographic determination of the combined effects of climatic factors--such as air temperature, humidity, air speed and radiation--from the viewpoint of body comfort. They permit comparison of various combinations of the above factors, as well as estimation of their relative weight and of the effect of their modification by mechanical means or by improvements in building design.

2. Their importance can be illustrated by the fact that in many cases certain design features produce opposite effects with regard to different factors. For example, increased window area improves ventilation, but on the other hand, in the Negev and similar arid regions, results in higher indoor temperature owing to the steeper increase in outdoor temperature compared with indoors. In these circumstances, it is impossible to evaluate the overall effect of increased window area without recourse to a thermal index permitting quantitative estimation of the relative weight of the temperature increment on the one hand, and of increased air speed on the other, for a given level of humidity.

3. The study of the relationship of the human body and its thermal environment is based on three approaches:

   a. Biophysical - analysis of the heat exchange process between body and environment.

   b. Physiological - determination of the thermal stress on the body through physiological responses.

   c. Subjective - determination and quantitative grading of subjective sensations.

4. A study was undertaken by the author with a view to correlating six different physiological and subjective-sensation studies on the same problem.

   a. It was found that the Effective Temperature (U.S.A.) attributes excessive weight to humidity near the comfort zone; above 40'C (104'F) agreement is closer. The weight of air speed is apparently correct in the comfort zone and at low humidity for higher temperatures but its weight is too low for high temperature and humidity levels.

b. The Equivalent Warmth from "Industrial Health Research Board Report No. 76," Great Britain, was found reliable in the comfort zone, but its upper limit is 35'C (95'F) for low humidity and 30'C (86'F) for high humidity, so that it is unsuitable for tropical conditions.

c. The Operative Temperature developed by Dr. L. P. Herrington, Director of Research, John B. Pierce Foundation, New Haven, Connecticut, does not include humidity among its constituent factors and is thus unsuitable about 27'C (80'F).

d. The Resultant Temperature (see illustration page 381) was found suitable for the comfort zone as well as for higher temperatures; however, in common with the other "temperature" indices, its unit rating (from the physiological viewpoint) varies with the temperature interval, increasing with the index level. The weight of air speed is low at high humidity and temperature levels (35'C, 80% relative humidity).

e. The Predicted 4-hour Sweat Rate was found reliable for high temperatures, but its lower limit being 28'C (80'F) it is unsuitable for the temperate regions of the country in summer and for the hot regions - during the other seasons. The weight of air speed is again low at high humidity. For high temperatures, this index can be considered as the most reliable of the six. (See illustration page 381)

f. The Heat Stress Index was found reliable for still air conditions at the temperature interval of 27-35'C (80-95'F) and the humidity interval of 30-80%, and at lower humidities also at higher temperatures, but exaggerates the weight of humidity at levels close to saturation point for medium and high temperatures. The weight of air speed is apparently also exaggerated, especially at low humidity. It is unsuitable for the comfort zone.

5. Conclusions. Of all six indices, the Resultant Temperature is apparently the most reliable, under conditions of still air, over a fairly wide range. For regions and types of buildings with an indoor temperature not exceeding 30'C (86'F) the Equivalent Warmth is also reliable. For climatic conditions about 28'C (80'F) the Predicted 4-hour Sweat Rate is very suitable. With regard to air speed, none of the indices seems to be suitable for high humidity levels.

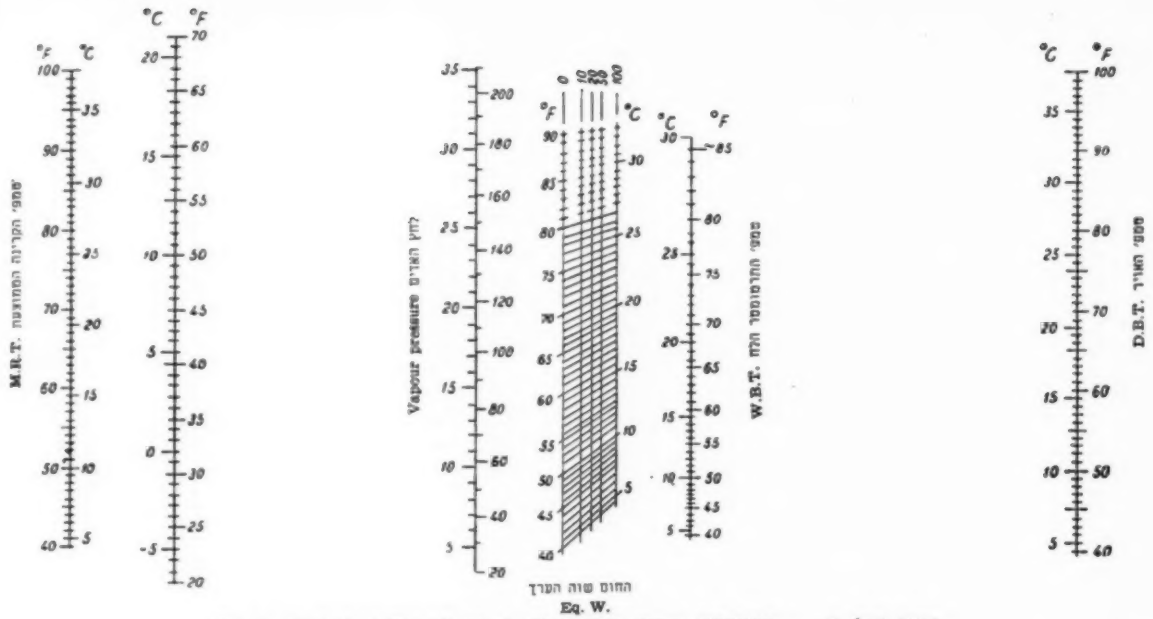


Fig. 2. Equivalent Warmth Chart. **נומוגרמת החום שוהיהעריך — ציור מס' 2**

Reproduced from "Industrial Health Research Board Report No. 76", "The Warmth Factor in Comfort at Work", by kind permission of the Controller of Her Britannic Majesty's Stationery Office.

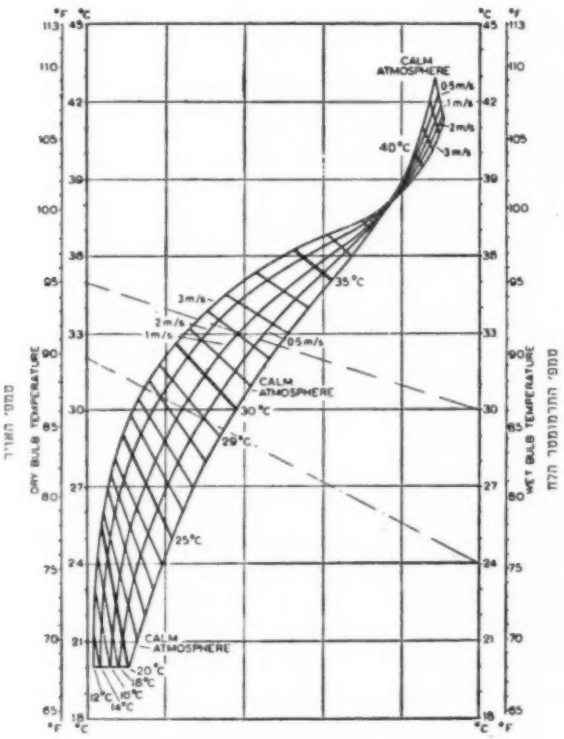


Fig. 4. Resultant Temperature Chart. **נומוגרמת הטמפרטורה השקולה — ציור מס' 4**

Reproduced from the "Journal of the Institution of Heating and Ventilating Engineers," Nov. 1959, by kind permission of Prof. A. Missenard and the editor.

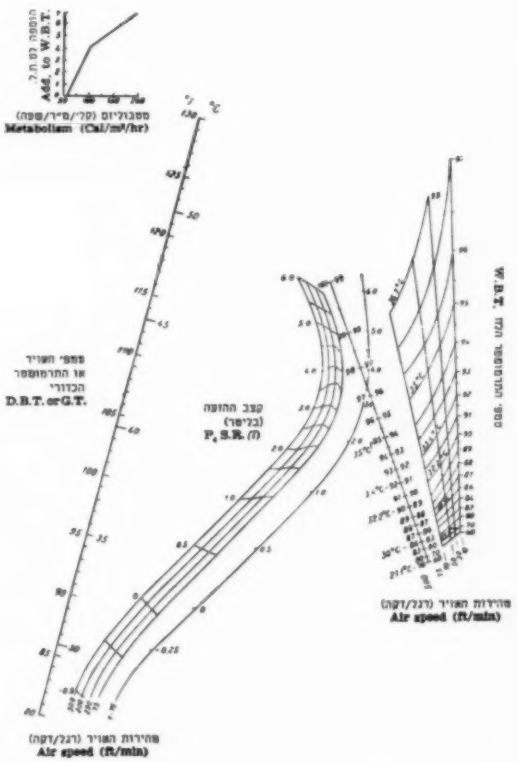
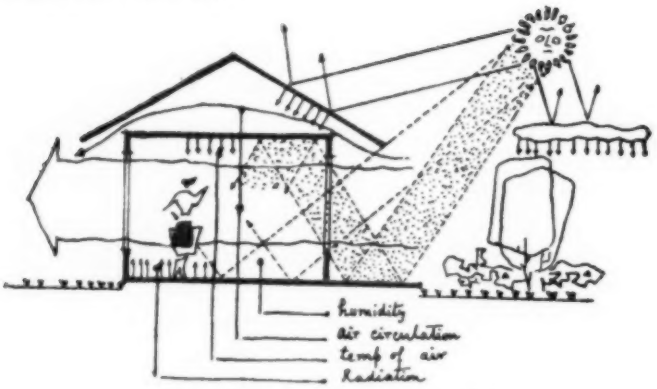


Fig. 5. Predicted 4-hour Sweat Rate Chart. **נומוגרמת קצב ההזעה החזוי ב־4 שעות — ציור מס' 5**

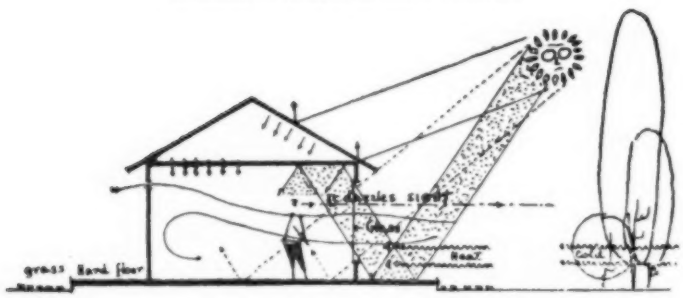
Reproduced by kind permission of the Medical Research Council, London, from the paper of McArdle et al.[8] quoted by F.E. Smith "Indices of Heat Stress",

COMFORT

SOME INDONESIAN ANALYSES

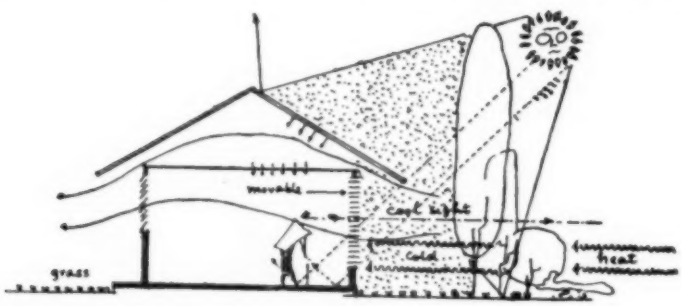


Influence of natural factors on comfort



NOT GOOD

- Colour of the old roof
- Short opening below ceiling
- 'Cross-Ventilation' less
- Entrance of more sun
- More Pavement
- Tree far away from house
- Using more glass
- Roof and walls do not get much shadow



GOOD

- Colour of the new roof
- Long opening below ceiling
- 'Cross-ventilation' enough
- Fixed 'movable louvres' Entrance of light and air circulation can be adjusted
- Enough pavement
- Trees in right places
- Exact amount of glass
- Roof and walls get enough shadow

[Translated from Indonesian. By Courtesy : Regional Housing Centre, Bandung, Indonesia]

Abstracted from a Report from the Bandung Regional Housing Centre, Bandung, Indonesia, 1960. 35 Pages.

PLANNING FOR CONSTRUCTION

Hans H. Karnov

1. The technique outlined in this paper by a United Nations Technical Assistant at the Bandung Regional Housing Centre is of great use in construction where a simple method of organization is needed. The forms illustrated are easy to prepare and follow, as well as a help in preparing construction programs.

2. Checklists and Time schedules as Tools. The complete building process is a rather complicated one. Many problems have to be considered, details to be fitted together, and decisions to be remembered. If you were not depending on other people, and other people were not depending on you, and if you have got the brain of a chess grandmaster, you might be able to solve the puzzle in your mind without use of tools, and remember it. But very few have got such a mind, and anyway you have to consider other people too. Therefore appropriate tools should be employed, so that the single bricks as well as a complete picture can be held directly before the eyes. Generally speaking it should be something on paper, so it can be easily reproduced, such as a checklist or time schedule.

3. The less complicated of the two is the checklist. In a simple form it only states a number of things to be remembered for consideration or for action, and it is easy to see how information about WHEN, by WHOM, etc., can be included--eventually also HOW. Such a list may do a good job as memorandum, as information and as instruction. Furthermore information about WHETHER and WHEN something has been done may also be added and it will still be possible to maintain a simple schematic form, easy to handle.

4. The more advanced tool in planning is the time schedule. Time schedules are actually all kinds of prearranged sequences. Two reasons why time schedules never have been too popular within the building trades are, that normally they are referring to dates fixed for the whole period long before anybody knows exactly when it will be possible to start, and also they rarely include any information about original assumptions. Actually the calendar relationship should not be added before really needed. The original time schedule should be based on the number of work weeks and working days needed. Personally I prefer to add the dates in pencil when needed above the numbered working days. Then I know the present situation, and I will have a rather good idea about conditions in the near future. Adjustments taking into account changing conditions can easily be made, without affecting the carefully elaborated time schedule itself, and it is easy to keep the time schedule up to date.

5. Basic figures and calculations should always be stated directly on the time schedule. Then all information will always be ready in case major revision is needed. It can be done by adding a few extra columns only, including for example information for each operation about:

Quantities
Estimated output per man-day
Calculated number of man-days

When that is done, all necessary information will be ready for adjustment, and furthermore it will be much easier for other people to check the time schedule with their own experience, to understand it, and consequently use it. Some people often add two more columns:

Number of workers within each group (operation/skill)
Resulting number of working days

6. Principles for Smooth Operation. The first is, that within each skill workers should be allowed to specialize. In connection with specialization, workers should be as continuously employed as possible.

7. Peak periods should be avoided. Every increase of the number of workers means more instruction (and the workloads on foremen and supervisors are heavy enough without this), and time and efforts will be wasted if people are not needed anymore after a short while. The normal pattern of employment for construction increases extremely slowly to a short peak period and then drops off equally slowly. This is not efficient, as during the first period time will be wasted giving instructions. Through the preparation of a proper schedule it is possible to have an employment pattern with a sharp increase in workers to a maximum which extends a long period of time before there is a sharp decrease. The maximum number of workers for this is considerably smaller than in the first case, but still the building period will be shorter, and instruction (the working-in period) is concentrated at the beginning. This second pattern based on a planning period at the beginning also often results in the actual saving of man-days of labor.

8. One more important principle should also be mentioned: whenever possible, repetitions should be introduced. It is important that people are allowed to specialize, and the best way is to let them repeat certain limited operations as many times as possible. Experience has shown, that man-hour consumption decreases considerably the second time the same operation is carried out, and again the third time until a minimum has been reached.

9. Planning the Building Site. Most of the work on a building site can be described as transport or, using another term, materials handling. Two main groups have to be considered: vertical and horizontal. Usually quite different kinds of equipment have to be used, and special attention has to be paid to the vertical transport in many countries where multistorey buildings are the most common. Equipment for that purpose usually will be relatively complicated and expensive, and in planning it often has to be regarded as

"key-equipment." This is not discussed as the primary problem in Indonesia as primarily one of single storey building.

10. Transport is comparatively simple to rationalize through planning. Many planners appear to feel completely satisfied, when they have concentrated on the central part of the building period, including the rough and heavy work, the masonry period. The periods before and after they regard as less significant. In a way they are right, because the masonry period includes the main part of the transport. But problems may be quite different during the remaining parts of the period, and if they are not properly considered, it may cost a lot of money, which could easily have been saved.

11. With the time schedule as basis it is easy to determine a number of typical periods. More than one layout will in most cases be needed, even if certain features naturally have to be the same, and all the layouts accordingly should be properly coordinated. Fortunately it is relatively simple to plan a site layout, so it does not mean much extra work to make a few more plans--and it really pays. Just think of such inconveniences as transport roads being blocked by earthwork, mainservices being delayed because materials or workshops are placed where they are supposed to go, or finished roads being destroyed because channels have to be dug through. A proper time schedule can easily avoid such inconveniences and save.

12. Time schedules and site layouts should be coordinated. If possible they should be worked out at the same time, or--if that is not convenient--the time schedule should be adjusted according to ideas developing during elaboration of the site layouts, or vice versa.

13. A greater number of site layouts will be needed, when you have got a large outspread building site. The idea of repetition may also be applied here and a limited number of typical site layouts, each including only a smaller group of houses, may be sufficient.

14. Whenever possible the approach to planning should be systematic. Previously I have pointed out, how checklists in many cases may be conveniently used. In this connection I shall describe a rather special type. It has been developed by Forschungsgemeinschaft Bauen and Wohnen, Stuttgart, Western Germany, and it has been published as one of their "Bautechnische Merblätter": In a table all the most important functions on the site (at a certain stage) are stated in vertical as well as horizontal columns. Where two columns are crossing the connection between the relevant two functions is evaluated by a figure between zero and ten. Zero if there is no connection at all, and ten if the connection is ideal. The idea is that you will be forced to consider how conveniently all the main functions are situated in relation to each other.

15. Forschungsgemeinschaft Bauen und Wohnen has also suggested another tool for site layout planners. It is an ingeniously simple, cheap and instructive one.

Actually it is just a table-sized sandbox. In the sand outlines of the site, accesses, internal roads, etc., can easily be drawn (with a finger), and can just as easily be erased. Small wooden blocks represent the various functions. The checklists and the sandbox should be used as tools during elaboration of the site layout, but the final result should naturally be presented as a drawing (or drawings), which can be copied.

16. So far I have described some of the tools which can be utilized during the elaboration of the site layouts. A few of the most important practical details to be especially considered should also be mentioned. The first thing is the access to the site. Almost 100% of all materials have to be transported to the building site from other places. Therefore it is important that the access is adequate. In most cases access has to be provided sooner or later and it is only a question of providing it so that it can be utilized throughout the building period. Additional expenses for maintenance and repair during this period will be insignificant compared to the use which can be made of the facilities during building.

17. Another simple and important rule for the layout of accesses and internal roads is, that trucks should be allowed to pass through in one direction. Rarely internal roads will be designed wide enough to allow trucks to pass each other. If two accesses are not possible, the internal roads should form a sling, so one-way traffic still can be established within the site--then there will only remain one point, where incoming and outgoing trucks have to meet. If it is not possible to establish any kind of one-way traffic, turning and passing space should be provided at strategic points.

18. In my country, Denmark, each autumn and spring we get difficulties with surface water at the building sites. During the rainy season you have similar problems in Indonesia. If no precautions are taken, materials are wasted, and internal traffic and transport may be seriously hampered. Again it is a question about the time factor. Proper surface drainage has to be provided sooner or later. Usually the final surface rehabilitation will be done at the end of the building period and ditches, drains, etc., will then be provided. But again, why not provide them at an early stage? Even if the work cannot be finished completely, it may improve the conditions considerably--and for hardly any extra cost.

19. As a last detail I want to stress the importance of providing proper storing facilities for materials. For some a floor should be somewhat elevated from the ground, for others a simple roof; some should be fenced in, and some should be stored in closed (maybe locked) sheds.

20. "How," "When" and "Why" Should Always be Kept in Mind by the Designer. I am going to present a Danish example which shows that even small details may considerably influence work conditions. On a one storey school building walls were made of brick. The flat roof was a simple structure with rafters of timber spaced 90 cm, boards and bituminous felt on top, and fiber boards fixed directly below the rafters. The cavity between the rafters was filled with insulating material. According to the

PROJECT: PL. BY/DATE

NOMINAL WORKING - WEEKS / DAYS NUMBER

Nº	OPERATION	OUTPUT PER MAN PER DAY	QUANTITY	MAN-DAYS SKILL/UNSK	SKILL
1					
2					
3					
4					
5					
6					
7					
8					
9					
a	b	c	d	e	f
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

dates to be added or adjusted when needed

g

LABOUR NEEDED		
	MASONS	x
	CARPENTERS	o
	UNSKILLED	-
	TOTAL	

A4 - 297 x 420 mm

drawings the brickwalls were supposed to be carried up between the rafters, closing the cavity and protecting against birds, rats, etc., which otherwise might enter through the overhang. The three layers of bricks between the rafters were supposed to fit close to the rafters as well as to the fiber boards, and the sequence therefore had to be the following: walls to be carried up to ceiling height, rafters to be placed, three layers of bricks to be added, and then the fiber boards could be placed.

21. What happened during the execution? Well, the bricklayers finished the walls to the proper level and moved to another part of the building with scaffolds and everything. After a few days the carpenters started on the roof. As soon as they had placed the rafters (which was done in a very short time) they told the bricklayers to come and finish the remaining three layers. The bricklayers were now occupied with another operation, and although it was within the same building site, they did not want to stop then. They were working on incentive pay. Any interruption would be followed by reduced productivity and consequently less pay. There was a lot of discussion and delay, and both the carpenters and bricklayers suffered loss of productivity and money as did the employer. At last the bricklayers had to give in and finish their job, so that the carpenters could continue with the fiber boards.

22. The troubles might easily have been avoided with another borderline between wall- and roofstructure. If only the bricks between the rafters had been replaced by vertical timber boards no troubles would have appeared. The bricklayers could have finished the walls up to ceiling height (as they did), but then their assistance would not have been needed later, as all the remaining work was carpentry. Technically this solution would have been equally good, and work conditions definitely would have been improved.

23. A funny thing is that this problem actually was pointed out during the planning stage. The architect agreed to make a revision, but it was forgotten, as it was regarded as a minor detail only.

24. This example concerns one contractor only, but it is equally important to solve problems in which more contractors are involved, as suggested in the following. Main structures for a group of houses were carried out by a Swedish contracting firm, and the central heating system by a sub-contractor. The heating system was supposed to be installed at an early stage, so it could be utilized for drying out the main structures before internal finishing. (That is a generally accepted procedure in the Scandinavian countries.) Here is the problem: if radiators are hung on unfinished walls, they must be removed later for finishing the wall behind them, and then replaced. That means extra work for the sub-contractor, and he has to return to the building after he has finished his job. It is the generally accepted way to do it, but in this case we tried to review the consequences, and we also found a cheaper solution.

25. A reasonable compromise was to finish just the parts of the walls behind the radiators and leave the rest until later. It would be a little more complicated for the main contractor as wall finishing had to be divided into two parts and his costs

would increase. A detailed cost estimate showed that this was the cheapest overall solution. The extra costs for the main contractor were considerably less than the saving of the sub-contractor. The sub-contractor cut his price accordingly and this was the method used.

26. Now it happened that the main contractor's field agent was relatively young and inexperienced. He did not recognize the idea and feeling most responsible for the work to be carried out by his own people he demanded that the sub-contractor hang the radiators on the unfinished walls. This way he achieved the best work conditions for his own people and the lowest costs for his employer. But now the sub-contractor had to remove the radiators then replace them. As this cost was not included in his contract, he sent his bill to the main contractor who had to pay. This exceeded any direct savings achieved and so it was proved in cash that the new idea really was a good one. That it was not followed was due to lack of proper instruction and control.

27. As conclusion I once more want to underline the words HOW, WHEN and WHY. These are important to all parties concerned with housing and planning. Even when these questions are used merely out of curiosity results may develop. In many countries many old traditions have survived only because of lack of this kind of curiosity. Conditions may have changed, other materials or structural details may have been introduced, but arguments have been forgotten--old traditions are maintained because nobody asks the proper questions.

Abstracted from "International Review
of Community Development" No. 5,
1960. Pages 87-94.

COMMUNITY DEVELOPMENT AND DEVELOPMENT

E. de Vries

1. E. de Vries, Institute of Social Studies, The Hague, discusses the three following propositions:

   a. Modern techniques of promoting development have made a harmonious cooperation with a movement for community development more difficult.

   b. Rapid and balanced overall development almost everywhere requires active participation by the people and their organizations, in other words--the philosophy of community development.

   c. Consequently, concerted efforts, must be made to obtain a close and fruitful relationship between community development and general economic and social assistance and development.

2. Community Development in Modern Society. The origin of community development is not to be found in low-income, subsistence farming areas, but rather on the fringes of a highly organized market economy with great economic and social mobility. In this society, characterized by industrial development, urbanization, specialization, the living local community became endangered. Community development is a spontaneous reaction to disintegrating forces, and not originally a tool or policy. But it can easily become a method, applied with the desirable end in mind. The reasoning behind this method is simple, but effective--community development is flexible, adaptable to circumstances and people's mood. It promises a great result with small outside resources (by the release of internal resources).

3. The next step is the adaption of community development principles to problem areas --slums, backward river valleys, where large outside resources are going to be applied and it strikes the imagination that perhaps the output can be enlarged in a way similar to community projects--by the release of moral, physical and financial resources from among the benefited population. One should, in these cases, carefully distinguish between forces from within and assistance (also moral, spiritual, organizational) from the outside. In all cases, I still would look upon community development as accessory to the autonomous process of modern society.

4. Community Development in Developing Modern Society. In many a modern society it is now considered a responsibility of the national government to help speed up the growth of national income, most likely also to influence the spreading of aggregate income over

groups, over regions, over individuals. And being called upon to indicate one's opinion results in obligations when government resources or other public funds are spent in the region. Community organizations may become the corollary of planned development.

5. Community Development and Macro-economic Planning. Community development approaches or techniques are hardly applicable when society is studied (or plans made) as sectorial activities (agriculture, industry, housing, etc.) It should, however, be possible to combine macro-economic planning with a community approach, if the latter is taken in the sense of a district or community-block. In India this has become accepted philosophy and a serious attempt of implementing procedure is made. In the Netherlands likewise, various attempts are made to dovetail a provincial, regional approach into the macro-economic pattern. In Yougoslavia the idea of a strong central planning is combined with the idea of local responsibility.

6. Community Development in the Pre-monetary Economy. Community activities are the backbone of the operation and stability of non-monetized societies. Forest clearing, irrigation, house construction are community activities rather than individual efforts and for technical reasons--economy of scale--must be. At the same time, they perpetuate but do not develop society. I am not against the use of this developmental tool or maintenance agent. But using the existing community for purposes of higher authorities becomes difficult when the money economy develops, when people differentiate their activities.

7. Community Development and Regional Development. Stimulated and organized community development has a better chance in the framework of a more or less comprehensive regional development, such as a river-basin project. This setting allows for consultation of the inhabitants before the plans are developed, their cooperation in local elements in the whole project (watershed management, detail irrigation canals and the like). Last but not least the implementation and use of the new assets is specific enough to call for local responsibility and sense of citizenship in order to stimulate active participation of the population. In United Nations usage this type of community development is called the project type.

8. The Comprehensive Community Approach and Development. Another situation again exists in countries where the government is determined to accomplish a rapid nationwide balanced development and has chosen for the community development approach. Generally, this situation prevails in countries with restricted resources and a majority of the population just emerging from a near-static near-subsistence level of production. In these circumstances there is a comprehensive need for "everything at the same time." Experience has taught that the speed which is needed for the "take-off" requires a total approach to total need. The functional distinctions between educational, medical, agricultural, marketing, social, engineering services to be rendered to the peasant and his family, to the village and its inhabitants, fails. The key-figure in this situation becomes the multi-functional village worker, who

identifies himself with the total needs of the people and at the same time is the catalyser in bringing forth their action and the carrier of assistance from outside. By this identification--a most responsible delicate and difficult task--the "multi-purpose" worker becomes the link between the community and development. He should be able to translate the advice of a large number of technical services to the villagers, he should be able to formulate the needs of the community. If all goes well, there is a two-way flow of information through the community development service to and from the district, provincial (or state) and central authorities, leading towards efficient planning.

9. Planning Development through Community Development. If all goes well . . . The two-way flow is fraught with obstacles. First of all, there is the danger that from local sources an aggregate demand for development gets assembled, which far surpasses the total resources available and that therefore the choice becomes even more than without community development, a rather blind administrative routine. Secondly, one can hardly expect that the community worker, who must combine a number of superhuman qualities also is a master-planner. Coherence, mutual adaptability of sectorial development, market-prospects, leading towards timing and priority determination are most likely beyond his scope. A way must be found to reconcile the results of overall macro-planning with the requirements of community micro-planning. It would seem to me that various steps can be indicated which lead to this goal, when taken consecutively:

a. a thorough national survey of resources, markets, etc.;

b. a provisional distribution of resources over the planning period, both by functional sector and by larger administrative of geographic unit;

c. detailed regional survey of resources and needs within each unit;

d. a consultation between representatives of the smaller administrative units (blocks or districts) with the regional planning authorities;

e. in the meantime, the smallest units should have drawn up a list of urgently felt needs which could be carried out through community effort;

f. at the consultation mentioned under (d) it should be considered what needs will arise out of action as envisaged under (f). These results should be channeled to the national planning authorities and the distribution of resources (b) should have enough flexibility to assist local authorities where necessary.

10. The Function of Exchange of Experience and International Assistance. The community development approach is not easy and no organization has all the answers. It therefore is imperative to facilitate a thorough exchange of experience and provide authorities everywhere with the result of research and comparison. To my satisfaction, this is one of the main

recommendations of the recent U.N. Workshop in Public Administration Aspects of Community Development.

11. Secondly, it is my conviction that no abortive effort towards development can have more disastrous results than a failure of the community development approach for lack of techniques, staff or resources. The great majority of mankind lives under conditons of such intertwisted frustrations on the way towards development that only two roads seem open--community development or bloody uprooting of the community and people's life.

12. The provision of economic or financial international assistance through the United Nations or otherwise is even more difficult than providing for adequate national services. What is the "project" or "programme" to be financed? It cuts through the terms of reference of the specialized agencies, it demands little foreign exchange and promises a great deal of intangible and indirect results.

13. All these peculiarities work against it, as compared with large public works or big industries. As far as I know, the International Bank and the Export-Import Bank have hardly ever financed community development or even development through community development. The use of local counterpart funds, e.g., from the sale of surplus agricultural commodities offers a wide perspective in community development. The establishment of the new U.N. special Fund may help build the foundation for really effective international cooperation in this field and in the future--let us hope--also to its financing.

14. Conclusion. Most nations who start on the road to development and like to use the community development approach must make sure that they succeed. Failure leads to economic, social and most likely political disaster. If personnel and funds lack, it is advisable to limit the program to a small part of the national territory. If a government wishes to expand the program nationwide, long term planning in resource development, staffing and organization are of vital importance.

Abstracted from "Far East Trade"
Vol. 15, No. 9, Sept. 1960.
Pages 1146-1148.

ECONOMIC SURVEY OF ASIA AND THE FAR EAST

1. EKISTICS has abstracted data about the individual national plans for various countries in this area:

Ceylon	--Vol. 10,	No. 58,	August	1960.	Pages 99-101.
	--Vol. 10,	No. 60,	October	1960.	Pages 250-252.
India	--Vol. 8,	No. 50,	December	1959.	Pages 400-403.
Pakistan	--Vol. 8,	No. 45,	July	1959.	Pages 31- 37.

This article compares these different plans as well as the achievement of development throughout the entire region.

2. The United Nations survey of the situation in 1959 in Asia and the Far East brings out the following main points:

a. 1959 was, in general, a year of improvement after the moderate setback of the previous year, following adverse weather in the autumn of 1957 and the slow-down of industrial progress in Japan and India;

b. Volume of exports increased for all countries, and prices improved in step with the recovery of industrial countries from the 1957-58 recession;

c. Agricultural and industrial production established new records;

d. Production of food grains available mainly for consumption in 1959 was 11% higher than the year before.

3. Progress in Achieving Plan Targets. Many of the countries in Far East Asia will be near the completion of their present development Plans in 1960 or 1961. The Indian Third Five-Year Plan starts in 1961. China's current Plan covers the period 1958-1962; Indonesia's, 1956-1960; Japan's, 1958-1962; Pakistan's, 1955-56 to 1959-60; and the Philippines, 1956-57 to 1960-61. Generally speaking, it is true to say that most of the countries in this region are still some distance away from their food-grain production goals, although results are relatively better for export and manufactured goods.

4. The industrial development plans of most countries of the region provide for the installation or increase in capacity of the enterprises of the public sector. Only in a few countries--India, Pakistan, and the Philippines--are broad estimates included of

the development envisaged in the private sector. In general, there has been a more substantial rate of growth in industry than in agriculture in this region.

5. Long-term Trends, Prospects, and Problems. Over the period 1928 to 1957 it was found that the demand and supply conditions affecting the primary commodities in the world market had made a bigger impact on the primary exporting countries of the ECAFE area, causing them to fall behind not only the industrial countries but also other primary exporting countries, in volume of exports and in their value, measured in terms of manufactured goods. Another factor of crucial significance to primary exporting countries of this region is violent short-term fluctuations in the earnings of their primary exports.

6. But perhaps the most significant point made in this survey is that the experience of ECAFE primary exports shows that the great improvement in internal economic stability of the industrial countries has not been associated with a commensurate lessening of instability in export volume, prices and earnings of primary products in the post-war period. Indeed, neither the growth in output and income, nor the increase in economic stability of the industrial countries of the world, has resulted in a corresponding expansion or increased stability of trade in the primary commodities of the world.

7. Imports have been growing faster than the export-based capacity to import. This can be illustrated by the following:

a. The ECAFE region, a net exporter of food grains in the 1920's has become a net importer;

b. Almost all primary exporting countries of this region--many having achieved independence only after the Second World War--have embarked on programmes of economic development and social welfare, and have undertaken larger defense commitments.

8. From this the United Nations comes to "the inescapable conclusion that chronic balance-of-payments difficulties of primary exporting countries of the ECAFE region have not been caused by accidental or short-term factors, but are the result of fundamental economic changes; that is, changes in the supply and demand factors in world production and trade. These difficulties in the post-war years have been reflected to some extent by foreign assistance, but the primary exporting countries still find it necessary to deplete their external assets, increase foreign indebtedness, impose import restrictions, or slow down an otherwise technically and economically feasible rate of growth."

Abstracted from "Summary of Lectures International Seminar Conference on Housing" 4th to 31st May 1960.

REGIONAL PLANNING AND THE RELATION BETWEEN THE RURAL HINTERLAND AND THE URBAN CENTRE

A. Doudai

1. A. Doudai is the head of the planning and engineering department, Housing Division, Ministry of Labour. His lecture sets the problem in its wider context, though this abstract is primarily of regional planning in Israel.

2. The common denominator in Israel is water; water to ensure the full utilization of the soil potential--development of an intensive agriculture, water for the development of industry and for urban centres. The harnessing of natural water resources--water catchment, flood control, then the distribution of the water over the whole region, water diversion projects--could help very much to ensure a higher material and cultural standard of living for the inhabitants of the region.

3. Planning and development in Israel have not been consciously directed towards regional integration in its widest sense. Nevertheless the development of the country has in many respects brought us nearer to the objectives of regional integration. This is particularly true of the agricultural sector, and the relation between town and country. With the establishment of the State a policy of a balanced distribution of the population in the country was adopted by the Government, and this policy served as the basis for the national plan. The Plan envisaged that by 1965 the total population of Israel would reach 2,500,000 which would be distributed as follows: 18-20% rural population, 35-37.5% in small towns, and 42.5-47% in the big cities. The policy laid down to achieve this aim was based on:

a. Development of agriculture;
b. New urban centres (in particular regional urban centres for the rural hinterland) and consolidation of existing small towns;
c. Industrial development and dispersion of industry;
d. Development of an adequate communications network.

4. To carry out this policy the National Plan envisaged a geographical division of the country into 24 small regions or planning districts which approximately correspond to administrative district boundaries. In each of these planning districts an urban centre was planned either by establishing a new town or by consolidating an existing small town or village. These urban centres, with a planned population varying from 10,000 to 60,000, in accordance with their function and the potential of the hinterland, would be the regional economic, administrative and cultural centre. The National Plan proposed, and this is being adhered to, that industry should be directed, encouraged and induced

to locate in these regional urban centres. The industries that use local materials, particularly agricultural produce, would certainly find it advantageous to be located in the rural districts.

5. By 1960 we may say that we are following the basic aims of the National Plan, and development proceeds accordingly. The total population is about 2,000,000 of which about 15% is rural, about 35% small town, and about 50% is in the conglomeration of the three big cities.

6. Examples of Small Regional Plans: Affuleh and Lakhish. Affuleh: As early as 1921 large tracts of land were purchased in the valley of Jezreel, and agricultural settlements had been established in this swampland infested with malaria. Already at this stage it was felt that the developing rural region in the Valley of Jezreel would call for an urban centre. In 1925 such a centre was established at Affuleh. It was located in the geographic centre of the valley. At the crossroads of main communications routes. Even so the site chosen was unsuitable for an urban concentration. It was located on heavy soil and low-lying land, in difficult climatic conditions. It deprived the rural community of good fertile soil, and its potential as an urban centre was questionable from the start. In addition, there was a shortage of water. There was another very important, socioeconomic factor which considerably hindered the normal development of the town of Affuleh. The majority of the agricultural villages in the region were collective settlements, self-sufficient, and ideologically disapproving of town life. The collective settlements came into contact with the big overcentralised cities for all their needs, bypassing the small regional towns. This was so because their central offices were invariably located in the big cities. The collective settlements also achieved a much higher cultural standard than the small regional town is able to achieve. Economically they are completely independent of the regional town, and even develop their own industry, instead of helping to consolidate the small town by locating industrial plants there. In short, the collective settlements did not provide the necessary rural hinterland for the development of a small regional town.

7. Until recently, after the establishment of the state, Affuleh suffered very much from the above described deficiencies, and its development was slow and painful. In accordance with the regional plan the further growth of Affuleh has been directed to the adjacent hills which enjoy favourable climatic conditions. To achieve a balance of country and town, some 15 co-operative villages have been established in the region.

8. Particularly interesting is the planning of the Ta'anach District. It is an area of 20,000 acres south of Affuleh which has been settled during the last five years. Thirteen co-operative villages have been planned in this district, and they will rely on Affuleh as their regional centre. In this way we hope to achieve integration of town and country, and help to consolidate the development of Affuleh. All the main central services--administrative, commercial, cultural, secondary education and

specific agricultural or technical education, health services, etc., are located in Affuleh. Industry, especially industry for the processing of agricultural raw materials grown in the region (e.g., a sugar beet plant), is encouraged and directed to Affuleh.

9. The Lakhish Region. This is a region that has been planned on virgin, almost completely undeveloped land, an area of some 190,000 acres which could not be defined as a geographically distinct unit. Although the soil is very fertile, the area has not been under intensive cultivation since ancient times, and was very thinly populated. Much of the area suffered badly from erosion. The reason for this was not that it was overlooked, but lack of water. There is no surface water in the area, and underground tapping gave negative results. The newly laid Yarkon River Diversion provided water and created opportunities for development. The offices of the Lakhish Authority are located in the regional town, Kiriat Gat, and from there they plan and guide the development of the region. (Kiriat Gat is described in EKISTICS September, 1957, Vol. 4, No. 25, Pages 36-37.)

10. The development has been planned on regional lines aiming at town and village integration. It has been estimated that the population of the area will reach some 35,000 - 36,000 inhabitants of which 50% will be farmers living in the villages and the other 50% artisans and professional workers in the village centres and the regional town. But as the development of the area proceeds, one can already see that there has been an underestimation, and also that the proportion of the urban population in the region will be higher.

11. The main agricultural products of the area are industrial crops: cotton, ground nuts, sugar-beet, etc. The crops are processed in the area instead of in the big cities, and leave it for the markets as finished products. In this way, it is ensured that the profit on the industrial processing remains in the area, to contribute to a higher standard of living. At the same time, transportation costs of the produce are considerably reduced. All industrial plants are being concentrated at an industrial estate situated on a railway line in Kiriat Gat. There will be only one urban centre in the area, where all industrial and main commercial services are concentrated and from where administrative, cultural and educational activities are directed.

12. To ensure successful development of the area as one functional unit and to achieve town and village integration, it is essential that the different branches of activity should be started and developed at the same time. By beginning development of the town and the villages, agriculture and industry, all at once, by establishing the local and regional centres of economic, cultural, administrative, and educational activities right from the beginning, we hope to guarantee their natural growth and consolidation into a well-integrated regional unit.

13. The problem of the local, village service centres has been solved here in a different way from that described before in the Ta'anach District. The villages were planned and built in keeping with the conservative approach, as separate units of 80-100 farmsteads,

but with much smaller centres. These centres provide only the daily needs of the farmer and the services for the youngest inhabitants: a kindergarten, a small cooperative shop, a synagogue or club and an office. Each 4-6 villages were formed into a group with a total of some 1,600 - 2,000 inhabitants. For every such group a village group service centre has been built. Some 100 - 120 professional and technical workers' families live in these central villages to provide the services for the farmers belonging to the group. In the centre, there is a large cooperative store, grain and agricultural implements supply store, cold storage, mechanical and artisan workshops, tractor station, etc. The cultural and educational facilities comprise a primary school, a centre for continuation classes, a community hall, library, sports ground, and swimming pool. There is a health centre and clinic, with a permanent doctor on the staff. These centres not only provide services for the rural community but are the place of meeting of all the inhabitants of the villages belonging to the group, and will be conducive to social cohesion in the area.

14. Experience has shown that if the various ethnic groups are kept completely separated from one another, the result is that every group continues to practice the way of life to which it is accustomed, and does not adapt itself to the new form of existence. On the other hand, the complete shattering of traditions that follows from the indiscriminate mixing of groups in a single village only undermines social relations, without encouraging any further rapprochement between the groups. The solution proposed in the Lakhish Regional Planning scheme, that each village be composed of one ethnic group and that the bringing together of the various communities be done through a rural center, where all the co-operative services of the villages in the area are located, has proved the most efficient method of achieving the desired aim. In this way a gradual merging of the communities is made possible without periodical crises.

15. The settlers regularly meet one another in the rural center, and occasionally in the regional town. On the one hand intimate village life, with each community preserving its own customs and individuality, goes on with considerably less friction than would be the case if the different ethnic groups were haphazardly mixed together. On the other hand, there are many opportunities for the various communities to come into perhaps more formal, but mutually respectful contact in the village group centre.

16. Regional planning enables the gap between these two approaches to be bridged. The mainspring of this method consists of a system of suitable technical, planning, educational and instructional instruments that make it possible for western know-how and technology to be developed internally and organically within the traditional social texture without destroying it. Except for agricultural and technical instructors, professional and technical workers and a few public-spirited men, the population of the Lakhish area in town and villages is nearly all composed of new immigrants originating from North Africa. Only a couple of villages were founded by the sons of veteran Israeli farmers. Until the new immigrants are trained in farming and other trades, and until they are able to direct their community life, the area will be

administered by the Lakhish Authority, coordinating all activities. Groups of instructors, social workers and administrators conduct the affairs of each village and train the new settlers. The advance towards maturity and self-sufficiency is a process in which town-dweller and village farmer take an equal part. The fact that it is a combined endeavour of all inhabitants of the area will further the integration of all communities. It is hoped that the settlers will gradually take the administration of the area in their own hands, and that in this process full town and village integration will be achieved.

17. Settlement in the Lakhish Region began about five years ago. We can already say that development proceeds very favourable. The programme for development, and the plans which were prepared before we embarked on this experiment have proved, with few minor alterations, a solid basis for the healthy integrated development taking place in the region.

Abstracted from Town and Country Planning
Summer School Overseas Section, 1960

THE PLANNING OF GREATER DJAKARTA: A CASE STUDY OF REGIONAL PLANNING

Kenneth Watts

1. Kenneth Watts served as town planning adviser on a United Nations appointment to the Ministry of Public Works and Power of the Republic of Indonesia. The Outline Plan for Djakarta which is discussed was prepared in collaboration with Mr. R. S. Danunagoro, Director of Public Works of the Municipality of Djakarta, and Mr. L. O'Brien, City Planning Officer.

2. The Significance of the Region. Our reasons for attempting to delineate this region were quite practical. The crux of the problem with which we were faced was that of dealing with the enormous population increase taking place in the big city and I shall argue that the only way of attempting to deal with this is on a basis wider than that of the city itself.

3. We estimated that the annual increase in population in Djakarta during the late '50's was about 80,000 and were told by local statisticians that our estimates were probably conservative. They may be right. It is moderately certain that during one year in the early '50's nearly one-quarter of a million more people migrated into the city than left it. About one-half of this figure of 80,000 represents the estimate for natural increase--that is excess of births over deaths--the other 40,000 (which may be higher) being the estimated net inward migration. All the signs indicate that the natural increase of the population in developing countries will increase, not diminish, in pace during the coming years.

4. If we can find some way of reducing the volume of the net inward migration, the problem might become less intractable. We estimated that on the basis of natural increase alone--that is with nil migration--the population of the city would reach about 3.3 million by 1977; but if present migration trends continue into the future, it is likely that it would reach 4.5 million or even more, during the same period. Thus although migration only accounts for half the current rate of increase, the long-term effects of reducing it could be substantial.

5. This migrational flow can only be impeded by attempting to stop off or deflect it at its source, that is, in the hinterland. Is it possible to convince the migrants who are at present flocking into the city that it is a better economic proposition to remain in the hinterland rather than migrate into the big city? Although experience in other countries does not point to a very hopeful answer to this question, it is nevertheless one which is worth examining. Let us first be clear that we will not find a complete answer to our question within the context of the region: the fact

that people are migrating into Djakarta from all over the archipelago forbids this. Although, by our efforts within the region itself, we may succeed in deflecting the course of one-third of the migrants into the city, the diversion of the remainder requires the existence of other big cities capable of acting as powerful counter-magnets, as well as a prosperous countryside. Thus the importance of a national policy for industrial location, a properly phased programme of investment in the public sector and a deliberate attempt by the central government to stimulate growth in the rural areas is underlined.

6. The Economics of the Region. Some 2.5 million people live in scattered settlements which occupy the high ground above the rice fields outside the built-up area of Djakarta. They are almost entirely peasant-farmers, cultivating rice as the main crop. Roads are often non-existent, the villages being reached by bicycle or horse-drawn vehicles along narrow tracks, or by picking one's way through the rice fields. In so densely settled an area, the chances of encouraging more people than already live there to remain on the land seem remote. They are not, however, completely non-existent. In the first place, a large area in the eastern part of the region is affected by a multi-purpose river project at present under construction. When fully irrigated, the rich soils of the region will yield two crops of rice each year instead of the present one. In the second place, the long-term effect of introducing feeder roads, which are urgently required in the rural areas, is likely to be very great. Not only will they reduce the city's present isolation in its region, but also permit agriculture to develop away from its present subsistence level--the peasant farmer will have the incentive of growing crops beyond his own needs because he will see he has the route for disposing them for cash to the townsman. A further point here is that these roads are an ideal subject for aided self-help schemes, and can therefore be constructed at low capital cost. This has been done with some success on a pilot basis in the Djakarta region.

7. As a further consequence of a revitalized agriculture and a more satisfactory road pattern I would expect to see land use patterns emerge more comparable with those surrounding a European city of equivalent size. Our conclusion here must be that increased rural productivity is a more likely consequence from these measures than an increased potentiality of the rural areas to absorb population. In my opinion, the establishment of a greater equality in opportunity between town and country may provide a temporary respite in the rural-urban migrational flow. But over a longer term period, the increase in agricultural productivity will inevitably lead to urban industrialization, the manpower for which will come from the rural areas as natural increase continues to exert pressure on the limited land resources. What chances are these of deflecting this townward migration away from Djakarta?

8. There are only three towns at present in the region apart from Djakarta. Tanggerang (25,000), Bogor (130,000) and Bekasi (15,000) which are all located at distances between 20 and 30 miles away. All three are connected to Djakarta by road and rail, and in fact some 10,000 people use the Bogor railway line each day to come into Djakarta for work. Although Bogor's secondary industry is fairly widely based, rice-milling is practically the only form of industry in the remaining towns. If, therefore, the attempt to deflect the

would-be migrant from coming to Djakarta is to meet with any measure of success, it must be a cardinal principle of policy that plans to encourage industry in the big city should be made in concert with even more far-reaching plans for smaller centres. Unless this is done, the industries set up in the big city will act as further magnets to the would-be migrant, so that the rate of inward migration remains forever in advance of the capacity of the city to absorb it.

9. The Alleviation of Conditions in Djakarta. An Outline Plan was drafted during 1957, and formally accepted eighteen months later by the Municipality of Greater Djakarta as a basis for the future development of the city. As result of surveys carried out during the preparation of this Plan, we found that at least 300,000 of the people living there are badly housed; that there are only 230 miles of paved streets in this spread-out city to carry its 70,000 motorized vehicles; only about 80,000 of the population of the city were employed in industrial establishments using power machines, and of these, only about 25,000 work in establishments employing more than 100 workers; that 30-40 per cent of the child population between the ages of 6 and 12 were not attending schools, and those that were attending were taught in over-crowded schools operating in shifts for lack of space; and so on.

10. In 1954-55 a Five Year Plan was drafted by the State Planning Bureau covering an average capital expenditure of about Rp 2500 m a year in the public sector (Rp 30 per capita per annum or £2.5, $7). This is comparable with other developing countries such as Uganda (£3.9, $11.) and Ghana (£8, $22). A subdivision of the programme shows the following:

Agriculture	13 per cent
Energy and irrigation	25 per cent
Manufacturing and mining	25 per cent
Transport and communications	25 per cent
Social investments	12 per cent

The slice that Djakarta might expect from this cake would mainly be taken from social investments.

11. Turning now to Djakarta, we had already carried out a survey of its basic needs in order to make good existing deficiencies and cater for the expected population increase. Foremost in order of priority were the building of 25 miles of major roads, the drainage of more than 1000 acres of swamplands in the neighbourhood of the city to allow housing and industry to be built there, the further enlargement of the water supply system and the building of temporary schools, health buildings and markets.

The annual costs of such a programme was estimated to be as follows:

Health, education and public buildings	Rp 25 m	14%
Markets and abattoirs	Rp 10 m	5%
Town improvement schemes	Rp 50 m	27%
Roads and bridges	Rp 45 m	25%
Public utilities	Rp 32 m	18%
Housing	Rp 20 m	11%
TOTAL	Rp 182 m	100%

12. On the basis of an existing population of about 225 million persons, this corresponds to a rate of investment of about Rp 76 per capita per annum. If the proposition is accepted that the city should take its share of the national investment programme on a population pro-rata basis, this programme was clearly feasible. And, in fact, a rate of investment of about this order has been authorized under Presidential decree to implement works required in connection with the holding of the Fourth Asian Games in Djakarta in 1962.

13. M. Lucien Petit was appointed by the United Nations to study the finances of such a programme. He calculated that capital investment over the years 1954-1958 has been running at the rate of about Rp 50 m a year, mainly financed by Government loan or grant, for the construction of the water purification plant, some roads, and a limited housing, schools and health building programme. This was the equivalent of about Rp 20 per capita per annum--i.e., about one-quarter of the assumed national figure. Assuming that the rate of investment in city improvement programmes from the central exchequer continued at this level, Petit concluded that, under favourable circumstances, an annual loan of at least Rp 100 m could be floated by the Municipality of Djakarta. He considered that the Djakarta Plan could be financed in the following way:

Central Government loans, etc.	Rp 50 m
Long term loans	Rp 100 m
Short term loans	Rp 20 m
Results of increased taxation	Rp 20 m

14. It will be apparent that the proposed level of expenditure on housing is extremely low: only 10 per cent compared with some 30 per cent of the Development Fund expenditure for Singapore in 1958. We estimated that about 1000 houses a year could be built with this capital, compared with an estimated annual need of about 14,000. Here we come to a point of decision: should one spend money providing a universal water supply, drainage, roads to open up new land, and so on, or on housing? The conclusion reached was that the development of the city's basic equipment should have prior claim. The proposed Rp 20 m a year for housing would carry through a slum clearance programme, the remainder of housing need being met (as it is at present--not unsuccessfully--) by the jobbing builder.

15. Conclusions. Our present problems are due to the inability of the city to assimilate the rapid growth of population, and Djakarta is not alone in experiencing great difficulties in expanding its social overheads to keep pace. I have put forward the view that the only way to stem this migrational tide is to tackle the problem on a regional basis--to improve communications, to stimulate agriculture and to promote industrial development in the other towns as well as in the big city itself. By more closely equating opportunities between city and hinterland, this may provide a temporary respite to enable the city to strengthen its social defences. But I would stress my belief that this respite if it comes at all, will only be temporary.

16. Turning to the city itself, I consider that maximum efforts should be made, within the limits permitted by country development programmes, to improve the conditions in the city. I take the view that this effort should be directed mainly towards improving the basic equipment of the city rather than in housing at the present stage of their development when capital is short. Housing I would prefer to see left to the jobbing builder, whose traditional structures dominate the urban environment in many eastern cities today, and who, with proper guidance and control, can contribute much to the solution of problems which he understands quite well.

17. This solution may also be sound from a social point of view too. The people who are migrating into these cities preserve their rural outlook, and it will take two or more generations for them to form urban attitudes. Is there not perhaps some wisdom in allowing the majority of structures to be built in short life materials, during the period when these people are becoming accustomed to city life? Will it not allow them to decide for themselves what mode of life they wish to adopt, and what permanent buildings will express this best?

Abstracted from "Journal of the American Institute of Planners," Vol. XXVI, No. 3, August 1960. Pages 177-185.

PHILADELPHIA'S PHYSICAL DEVELOPMENT PLAN

Arthur Row

1. Arthur Row is Assistant Executive Director for the Philadelphia City Planning Commission. He was formerly the Assistant Director of the Detroit Metropolitan Traffic Study and was Director of Planning for Portland, Maine, from 1948-1951.

2. There are two main aspects of the Physical Development Plan. They underlie the objectives and run threadlike through the entire range of specific proposals.

a. The maintenance of the eminence of Philadelphia as the central city in a growing metropolitan area.
b. The improvement of the quality of the city's environment as a place in which to live and conduct business.

These are mutually dependent and mutually supporting. Economic growth brings with it the wherewithal, both public and private, for improving the living environment. Conversely, a better residential environment attracts industry. In the physical sphere, transportation improvements necessary for economic growth improve living conditions--for example by reducing traffic on local streets.

3. But these two aspects are also conflicting. Any site is both a local resource and a regional resource, both a "people's" resource and an "economic" resource. Resolution of these conflicts lies in defining a set of land use relationships that clarify the separate requirements, or in making a land use decision that deliberately chooses one over the other where compromise is impossible.

4. Scope of the Plan. The chief characteristic of the plan is that it is conceived and executed as a plan for a city. It seems to clarify and enhance urban opportunities. For example, although over-all residential densities are reduced, some areas are increased in density; although the largest increments of industrial land are proposed on vacant land in outlying areas, it is proposed to redevelop for industrial use some 1400 acres close to the center. Most important, Center City is planned for increase in activity and density.

5. The plan is for the city only. It is not a regional plan in which the city is given a predominant role. Regional projections have been made. Diagrams of regional development pattern have been prepared. The transportation plan at the expressway level and at the rail-rapid-transit level have been prepared (as distinct from arterial streets and surface transit) on a metropolitan scale. Estimates of population and employment distribution patterns have been based on these transportation assumptions. A regional park plan has

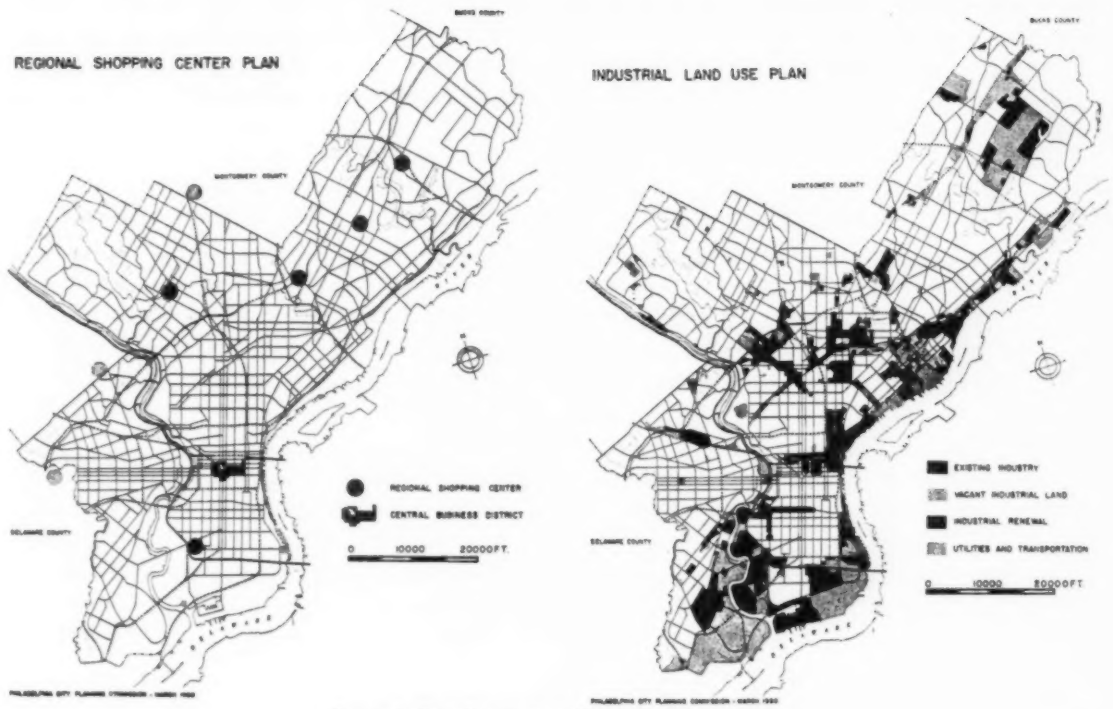


FIGURE 2. TWO EXAMPLES OF UNDISTRIBUTED FACILITIES

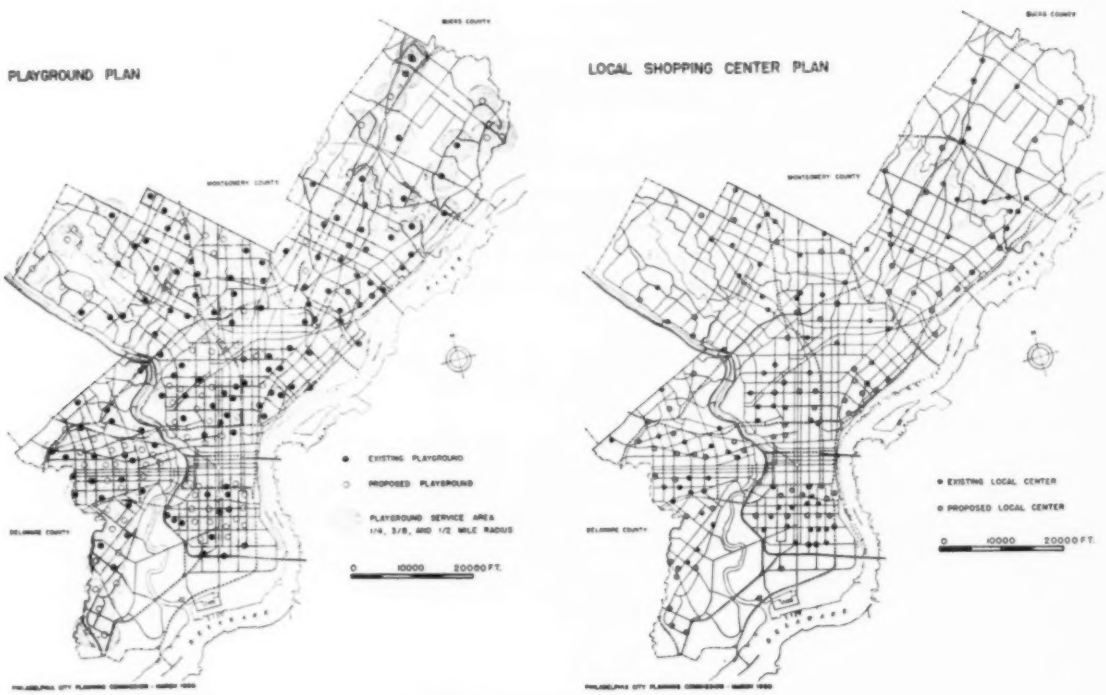


FIGURE 3. TWO EXAMPLES OF DISTRIBUTED FACILITIES

been prepared in cooperation with the surrounding counties. But the land use plan itself has been prepared only for the city. We are satisfied that within this framework the plan for the city will stand up in the long pull--provided that the transportation plan (also worked out jointly with the counties) is pushed to execution in a sequence that recognizes the pre-eminent needs of the Center City.

6. Regional Economic Center Objectives.

a. The development of Center City to its full potential. This requires an efficient, effective and dramatic pattern of land use at a very high intensity and a transportation system that will link Center City easily and quickly with the region.
b. The emphasis on the transportation system just referred to in servicing the region as a whole.
c. The need to meet the demands of industry for space in the Central City.
d. The requirement to support and if need be establish major regional centers of retail and office activity within a reasonable distance of Center City.
f. The expansion and enhancement of specialized regional resources in the institutional category: universities, hospitals, museums.

7. Cultural Objectives - the "people city."

a. Maximize the accessibility of the wide range of facilities that the city offers.
b. Satisfy the need for local identity in the undifferentiated mass of residential area of the city. It is proposed to achieve this by organizing the residential area into imageable and functional units of three levels: districts, communities, and neighborhoods.
c. Improve housing quality.

8. Time. The total plan can be achieved in 37 years at the present rate of capital investment by the city. If the city's spending for capital projects increases proportionately to the expected rise in personal incomes, then the plan could be completed in 28 years.

9. A Note on Techniques. In all work, we attempted to view the city as a systematic whole within the larger system of the metropolitan area. Four separate but related studies were undertaken on industry.

a. Trends in employment and space use in manufacturing activities in the metropolitan area. In addition to statistical analyses of employment, every firm that made a relocation decision in a ten-year period was interviewed.

b. An estimate of the future distribution of nonmanufacturing employment. Estimates of employment by industry type by area were made, using as a basic assumption the proposed transportation system, and using income and density as variables.
c. A study of industrial obsolescence aimed at providing a sound basis for industrial redevelopment strategy.
d. A construction of profiles of existing or potential industrial areas on the one hand and industry types on the other.

10. The plan for commercial areas clarified the need for, and requirements of, regional, intermediate, local and convenience shopping centers. It also provided a basis for dealing with that array of commercial activities which cannot be located in shopping centers.

11. A special subcommittee of a Technical Advisory Committee on Recreation developed a set of standards which take into account residential density, land cost, recreation program, and operating costs. In summary, the standards provide for smaller playgrounds more closely spaced with more intensely programmed use in the dense areas, larger more widely spaced playgrounds in the intermediate areas, and quite large, widely spaced playgrounds in the outlying areas.

12. The final technique worthy of special note is the procedure developed for putting price tags on the total plan and for relating it to the capital programming process. Basically, the system consists of:

a. putting a price tag on all the public costs implied in the plan and on all the city's capital investment requirements which may not be clear in the plan itself; e.g., refuse disposal requirements;
b. grouping the proposed expenditures under functional headings and constructing a profile to show the rate at which expenditures should be undertaken if all elements of the plan are carried forward at the same rate and completed at the same time.
c. preparing for comparative purposes a profile of the existing capital program.

Summary of Doxiadis Associates Report No. 25
Prepared for the Government of Pakistan,
Presidents Secretariat, Federal Capital
Commission, Ref. DOX-PA 77 (11. 5. 60)

PRELIMINARY PLAN FOR ISLAMABAD

Doxiadis Associates

THE NEED FOR A FEDERAL CAPITAL

1. Pakistan is an old nation which became independent in 1947. It has taken shape as an independent nation following the partition of the broader geographical area, inhabited by Moslems and Hindus for many centuries. Pakistan did not have a natural Capital from the outset, since it was created only after the division of people who had previously been living together in the same area.

2. The lack of a natural Capital was apparent. The selection of Karachi was a logical solution for the first stages of the life of the new State. It was a convenient centre of transportation, being a relatively large city and on the international air routes.

3. Karachi was not, however, a satisfactory solution from several other points of view.

4. Nobody was satisfied with Karachi as the capital and the people of Pakistan and their leaders have, right from the start, discussed the possibility of finding another solution.

5. If Karachi was to become the Federal Capital it would undoubtedly need to be reformed, and this reform would involve greater and greater expenses as time went on. Land values and private investments within Karachi would go on increasing, and the development of Karachi into a Federal Capital would be further and further delayed.

6. It was concluded:

   a. That Karachi as an urban centre, irrespective of its role as a Capital, is not satisfactorily built and will need a lot of changes in order to serve its normal functions properly.

   b. Its alteration and expansion into a Federal Capital would be problematic because the city has already been strangled (a) by external factors that have grown around it, such as the army, industry, etc. thus limiting its possibilities for expansion, and (b) by internal ones, such as the refugees and people coming from the countryside.

c. The cost would be high, the results would be small.

d. Whoever can afford to, tries to avoid Karachi because of its climate.

e. History attests that no city of major importance has ever been created on or near this site.

A NEW FEDERAL CAPITAL

7. The result was the decision of the President in February 1959 to create a Special Commission which started working on the preparation of a report concerning the problems of founding a new Federal Capital.

8. On February 1959 the President of Pakistan honoured Dr. C. A. Doxiadis by naming him an adviser to the Special Commission for the Location of the Federal Capital.

9. Following several months' work the Commission reached the conclusion that the most suitable location for the Capital is the area around Rawalpindi on the Potwar Plateau.

10. The Commission further recommended that the area be declared as a Federal Area.

11. On the basis of this report President General Ayub Khan decided in favour and made a public announcement of this effect on June 19, 1959.

12. A most important milestone in the history of the Capital was the decision taken by the Cabinet in February 1960 to give the new Federal Capital of Pakistan the name of Islamabad.

THE ROLE OF THE FEDERAL CAPITAL

13. A Federal Capital could:

a. Contribute to the better organization and formation of a new state, and become the Administrative Centre of the Nation.

b. Become the centre of culture and education and a real centre of national expression contributing to the development of the people, the economy and the culture of Pakistan.

c. Become a symbol of the new state and of the nation towards which the eyes of all people will look for unity and guidance for the consolidation of their new state.

14. Examples come down to us from earliest times of the decisions of the leaders of nations to transfer their administration to some new place, in the hope of solving their problems. Where the decisions were wise such plans contributed to the better organization of nations.

15. If a nation has reason for creating a new administrative centre in a new area it has also equally good reasons for creating a new cultural centre. This is a target to be achieved parallel with the creation of the administrative centre.

16. It is only in this way that the administrative centre will become a real symbol for the nation. Such a symbol must correspond to the aspirations of the people. Karachi could not become a symbol for many reasons. A new Capital has to become one and can become one.

17. The magnitude of the responsibilities of those in charge of the creation of Islamabad is unprecendented. Islamabad is not only the only Federal Capital created in our era for such a big country, one of 90 million people, but it is also the first case in which economics, social sciences and political and administrative aspects go hand in hand with technical, cultural and aesthetic aspects towards the design of a city.

LOCATION OF THE FEDERAL CAPITAL

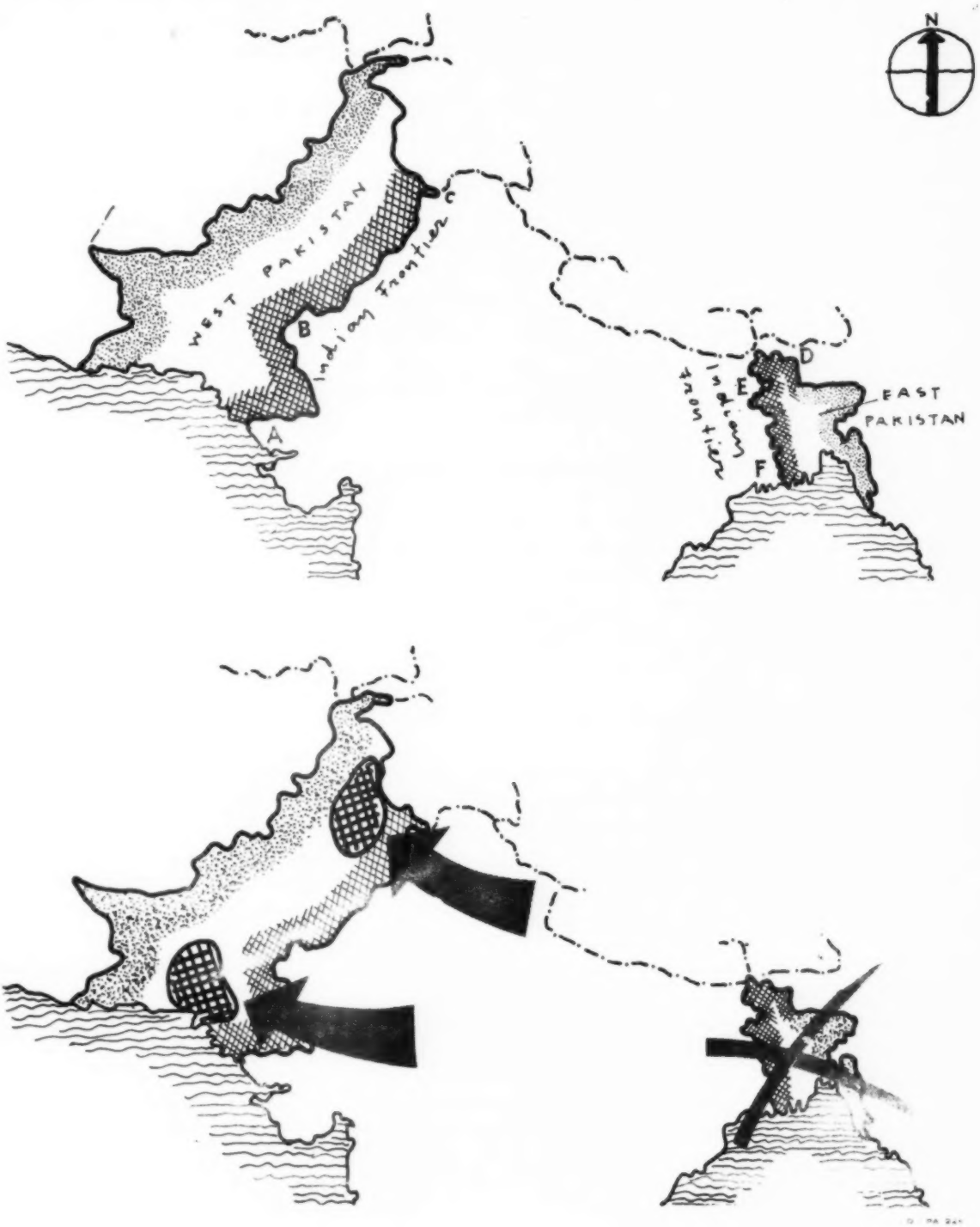
18. The Federal Capital if located on the site of a provincial capital would compete with it for the provincial functions. Therefore, any place near the centre of gravity of either East or West Pakistan had to be completely excluded: the one would compete with Lahore as the centre of West Pakistan; the other with Dacca as the centre of East Pakistan.

19. For strategic reasons it was natural to exclude all solutions at the periphery which are very close to the Indian frontier.

20. Theoretically, there were three possible areas left: the South and the North of West Pakistan and the lower part of East Pakistan. The third was excluded by all experts because of climate and geography. So two theoretically suitable areas were left.

21. After an investigation of the ideas which inspired the founders of Washington, D. C., Ankara Turkey, Canberra Australia and Brazilia Brazil, it was concluded that the creation of the Federal Capital on a completely new site as an independent city, quite unrelated to any other city, offers the best chance of an ideal solution to the problem. There will be no existing commitments and there will be nothing else to be respected except the programme of the new Federal Capital itself and the existing landscape.

WHERE THE FEDERAL CAPITAL ?



22. This solution, however, will have many disadvantages, the chief of these being that the cost of the creation of such a capital will be considerably higher and the initial stages of the creation will be very difficult as there will be no settlement for the administration of the Federal Capital, for the technicians, the workers, the suppliers, etc. Construction will be hindered by these factors.

23. If, on the contrary, the Federal Capital is to be built in relation to an existing city but at a reasonable distance from it,

a. It will be more economical to build the Federal Capital, as many of the facilities will be shared with the adjoining city: e.g. cost of airfield, highways, transportation, etc.

b. The existing transportation-lines, airfield, etc. can be used from the start by the Federal Capital, so that construction can start immediately.

c. The working force can be located within the area, thus avoiding additional investment for their installation.

d. Everything will move much more quickly.

24. It is, however, essential to avoid the Capital becoming a kind of annex of an existing city. For this reason a very good programme has to be worked out to provide for the birth of the Federal Capital as a city to be fed by the existing one, but gradually growing to such an extent that it will take its own shape as a city which is physically completely independent from the existing one. What is required is a very good programme and a physical plan, plus a strict adherence to them.

25. The conclusion is that the existing city and the Federal Capital should be within commuting distance.

26. The area around Rawalpindi offered the best geographical and climatic conditions, these conditions ensuring major strategical advantages. The Grand Trunk Road passes through the area, it is situated near to the densely populated area of Punjab and, finally, the land is rich in variety, thus offering the possibility of a suitable solution.

27. The map of South-West Asia shows that a chain of capitals of the States making up this part of the continent lie along an international route, undoubtedly laid out in olden times. This is the Grand Trunk Road running from West to East across Afghanistan and India.

28. Teheran, Kabul and Delhi are located on this route, the route which all civilizations have followed in their expansion. Reference must also be made to Taxila (not a capital city) which happened to lie very close to the area of Islamabad.

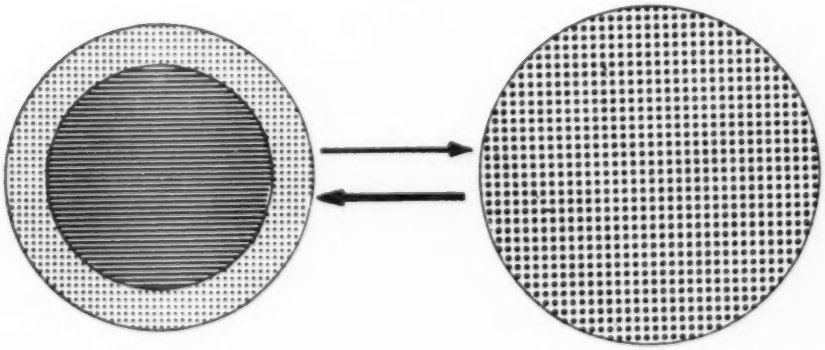
RELATIONSHIP BETWEEN AN EXISTING CITY AND THE FEDERAL CAPITAL

STAGE A : The new-born city is fed by the old

STAGE B : The new-born city grows. It is still being fed but to a lesser extent

STAGE C : Both cities are serving each other

STAGE D : The F.C. taking the lead. Both cities are serving each other



29. At Rawalpindi the wet bulb temperature enters the range of discomfort and low capacity for work in the months of June, July and August, when the temperature generally stays above 75°F. If Islamabad is located 1000 ft. to 2000 ft. higher than Rawalpindi, it will remain outside the uncomfortable limits of humidity and wet bulb temperature throughout the year.

THE SIZE OF THE FEDERAL CAPITAL

30. As soon as we speak of goals expressed by size, we must accept one basic definition - that no sizes are going to remain static. Let us give an example. The city of 100,000 people, which increase normally at 2 percent a year because of the natural increase of population, will exist for exactly four hours, even without considering any influx from the rural areas. After four hours this city will have 100,001 inhabitants, after eight hours 100,002, and so on.

31. The only way to envisage our goals in size is to relate size to time. A city like the Federal Capital will start with zero inhabitants, it will have a few inhabitants in 1960, and from then on as many people as serve its purposes and can be served by the facilities which have been provided up to that date.

32. Our goals, expressed in size, must be dynamic. Our new city must become the Federal Capital not for today, nor for tomorrow, but from now on for as long as the Government of Pakistan feels that it is the best place for a Capital.

33. On the basis of information supplied by the competent authorities on the salaries of the Governmental servants to be shifted to Islamabad, as well as of the data available on the income of the urban population of Pakistan, some estimates were made of the families of Islamabad by income-group.

34. In estimating the areas of land required the city has been divided into two main parts. The first part is what we would call the normal part of the city, comprising the residential plots and all usual functions of a normal city. The second part includes the special functions which are related directly to the Federal Capital, such as the Secretariat of the Central Government, the President's House, the Parliament, the National Museum etc.

35. Between the provision during the first five years of office accommodation for only 5,400 civil servants, corresponding to a population of 30,000 inhabitants, and the provision of office accommodation for the total of 21,000 civil servants programmed to be transferred eventually to the new Capital, there is a series of intermediate solutions. The Government will have to decide which solution is to be implemented, according to the final programme of transfer.

36. In all estimates, the assumption was made that of the total number of families to be accommodated in Islamabad during the first five years, 90% will be civil servants. This is a very high percentage, allowing for only 10% additional population. It is, however, believed that this could be achieved, thanks to the existence of Rawalpindi which could cover, at least for the first five years, a part of the needs of Islamabad in trades and professions.

N
Peshawar
Rawalpindi
Kalat
Sukkur
Indus R.
Godap
WEST PAKISTAN
Karachi
EAST
PAKISTAN
▲ Epicentres of Earthquakes

AVERAGE PLOT AREA BY INCOME GROUP

Income Group	Annual Family Income (Rs) Limits	Average	Percentage Breakdown	Average plot area in sq.yds Envisaged by the FCC	Suggested by DA
1	2	3	4	5	6
A	Up to 1,200	800	25%	137.5	110
B	1,200- 2,400	1,800	30%	167.5	150
C	2,400- 3,600	3,000	18%	220.0	180
D	3,600- 4,800	4,200	9%	417.5	200
E	4,800- 7,200	6,000	7%	565.0	250
F	7,200- 9,600	8,400	4%	1,100.0	360
G	9,600-12,000	10,800	3%	1,600.0	500
H	12,000-24,000	18,000	2%	2,100.0	750
I	24,000 & over	36,000	2%	3,350.0	1,500
Average plot sq.yds				402	215

AREA REQUIRED FOR THE CITY OF 50,000 INHABITANTS

	Area in sq.yds		Area in acres
Communities Class IV:			
Residential plots	21,50,000		
Buildings, sports grounds, parks	10,75,000		
Roads and squares	10,75,000		
Perimeter roads	13,20,000	56,20,000	1,161
Functions of Communities Class V and VI:		8,05,000	166
Administrative Sector			
Office buildings for 9,000 Govt. servants	1,44,000*		
Special buildings	86,000*	2,30,000*	48*
Foreign Missions		16,50,000	340
Main roads (perimeter roads of communities of higher order)		31,68,000	655
	Total	1,14,73,000	2,370

* These are minimum areas including only the built-up areas, the areas required between buildings for their proper insolation, and the areas for parking and roads.

37. A rough figure of 400,000 inhabitants can be assumed for the end of the first 20 years period of the development of Islamabad, when the population of Rawalpindi may be estimated as equal to some 700,000 inhabitants. Thus the total population of the two cities is roughly estimated at 1,100,000 inhabitants by the end of the 20 years.

38. Assuming from then on an average population increase of say 4% per annum, we conclude that a population of 2,500,000 inhabitants will be reached at the end of the second 20-year period, or within two generations from now. After this period the city will expand in a south-easterly direction that is in the direction of the growing centers of Rawalpindi and Islamabad.

39. After this period of 40 years or a maximum of two generations, and as far as one can at present predict, these cities will expand southwest of the Federal highway in the same manner as that in which they will have been moving up to it within this period, i.e. in parallel lines, taking one row of sectors after another. The pattern on which they have been designed allows for an earlier expansion of some of their functions. For example, Rawalpindi can expand earlier than Islamabad or vice-versa; or the cantonments can expand earlier than the industrial zone or vice-versa. Thus no major function will be hindered by the slow progress of the other zones.

COST OF THE FEDERAL CAPITAL

40. The first five years costs: i.e. building the initial city of either 30 or 50,000 inhabitants is estimated at 24.4 or 35.5 crores of rupees (1 crore = 100,000 rupees = $).

41. The costs of the Rawal Dam and airport extensions are not included in these estimates since they will not be financed from the sum allocated for the development of Islamabad.

42. The items in which private investment is likely to be interested constitute the following percentages of the total cost.

a.	Houses, including the corresponding land development.	41%
b.	Buildings, including the corresponding land development (it was considered that approximately half of the community buildings are of the type of which private people might be interested.	8%
	Total	49%

43. According to the above assumptions a programme of 24.4 crores was formulated for the first five-year period of development. Out of the above sum Rs 20.0 crores, or 82%, correspond to the Government investment of Rs 44, or 18%, to the private one.

THE COST OF THE CITY OF 50,000 INHABITANTS

Communities Class IV:		
Land development	2,90,25,000	
Houses	9,55,00,000	
Community buildings	1,43,25,000	
Parks, sports grounds etc.	31,50,000	
Perimeter roads	60,00,000	14,80,00,000

Item	Cost in Rs	
	50,000 inhabitants	30,000 inhabitants
Purchase of land	1,20,00,000	1,11,00,000
Communities:		
Communities Class IV	14,80,00,000	8,88,00,000
Functions of communities Class V and VI	2,38,00,000	1,42,80,000
Administrative Sector:		
Special buildings and green spaces	1,70,00,000	1,70,00,000
Office buildings	2,45,00,000	1,47,00,000
Land development	16,10,000	12,00,000
Area for foreign missions	1,07,00,000	64,20,000
General community facilities:		
Highways	2,17,00,000	2,17,00,000
Other facilities	3,17,70,000	2,55,00,000
Afforestation	20,00,000	12,00,000
Total	29,30,80,000	20,19,00,000
Add approximately 10% for study, administration expenses and other general expenses	2,93,20,000	2,01,00,000
Total	32,24,00,000	22,20,00,000
Add approximately 10% for unforeseen expenses	3,26,00,000	2,20,00,000
Total	35,50,00,000	24,40,00,000
or	35.5 crores	24.4 crores

RELATION OF GOVERNMENT AND PRIVATE INVESTMENT

5-year Programme Period	Investment			Population	
	Government %	Private %	Total Crores Rs	Average annual increase	At the end of each period
1st 1960-65	82	18	35.5	-	50,000
2nd 1965-70	67	33	60	24.6%	150,000
3rd 1970-75	56	44	72	12.5%	270,000
4th 1975-80	51	49	78	8.2%	400,000
Total	61%	39%	245.5	-	-

44. Should the Government decide to shift more civil servants to housing accomodation in Rawalpindi, then the item of office buildings and corresponding land development of the Administrative Sector should be increased accordingly.

45. Purchase of land: The whole area required for the works of the first five-year programme should be purchased during the first year. All formalities needed for the expropriation of this land, and the removal of the existing villages, should be taken the soonest possible in order to avoid any delay in the implementation of the programme.

46. Communities Class IV: The building of the communities Class IV should start during the first years. Work will begin with the erection of the houses for the lowest incomes. That is why the amounts of money shown for the first years are small. During the last two years these amounts will increase considerably due to the construction of houses for the higher income groups, a large percentage of which will be erected by private people. Parallel to the construction of houses the corresponding community buildings will be erected, starting with the most essential ones such as schools, markets, etc.

47. Administrative Sector: The construction of the buildings for the office accommodation of the civil servants of the Central Government is scheduled to start at a fast pace right from the beginning, while the special buildings were mainly programmed for a later stage.

48. Highways: This is the most urgent project. Construction should start during the first year and be completed the soonest possible in order to facilitate the access to the new Capital and avoid over-crowding of the Grand Trunk Road and Murree Road within Rawalpindi.

YEARLY BREAKDOWN OF THE FIRST FIVE-YEAR PROGRAMME

GOVERNMENT AND PRIVATE INVESTMENT

Item	Expenditures in lakhs of Rs					
	1960-1	1961-2	1962-3	1963-4	1964-5	Total
Purchase of land	111	-	-	-	-	111
Communities Class IV	50	80 (10)	130 (30)	280 (70)	348 (150)	888 (260)
Functions of Communities Class V, VI	-	5	20	50 (15)	68 (22)	143 (37)
Offices in the Administrative Sector	20	20	30	40	49	159
Special buildings in the Admin. Sector	-	10	20	40	100	170
Highways	30	100	87	-	-	217
Community facilities	20	65	70	55	45	255
Afforestation	1	2	3	3	3	12
Area for the Foreign Missions	-	5 (5)	10 (10)	20 (20)	29 (29)	64 (64)
Total	232	287 (15)	370 (40)	488 (105)	642 (201)	2019 (361)
General services and contingencies	48	63 (5)	70 (10)	102 (25)	138 (39)	421 (79)
Grand Total	280	350 (20)	440 (50)	590 (130)	780 (240)	2440 (450)
Government Programme	280	330	390	460	540	2000

NOTE: Figures in brackets give the part of the total corresponding to the private investment.

49. Community facilities: This is also an urgent category of works. Their construction should start right from the beginning and proceed at a fast pace. However, there might be a necessity to give temporary solutions until the main installations are completed.

50. Area for the Foreign Missions: The development of the area to be set aside for the foreign missions is programmed to start even from the second year, in order to enable the interested missions to start at an early stage the construction of their buildings of the new Capital.

PLANNING AND DEVELOPMENT AUTHORITY

51. Will be responsible for coordinating all endeavours for the development of the whole of the Federal Capital Region so that at all times unity of purpose will ensured. As far as the extent of the region to be controlled is concerned, this will be defined immediately upon approval of the regional plan which has to be prepared as soon as possible.

52. Within the Metropolitan area, PADA should have not only full control, but full responsibility for every development. Here PADA will itself issue the permits for every kind of building, even for the smallest one.

53. It is not conceived that it will be permitted to add houses to existing villages or to demolish houses, even within villages, without the special permission of PADA. This is because PADA may well think that some villages will have to be demolished later and that no investment should be encouraged or allowed in them, or that some villages must be preserved as elements of the national park and that thus no addition should be allowed to them.

54. The same is true of all other types of development within the Metropolitan area and not only of buildings and construction. For example, change of cultivation, or cultivation of new areas, will also have to be approved by PADA. The opening of new roads, even of minor importance, or the creation of new cantonments, will likewise have to have the general approval of PADA.

55. Within the area of Islamabad PADA will not only be the coordinating and planning authority, but also the executive authority. The same should be the case with the whole area of the National Park, as far as national institutions are concerned. No authority should be allowed to do anything without referring to PADA, which must have the opportunity to carry it out itself if it feels the project to be important for the national capital. On the other hand, PADA may, in exceptional cases, authorize the interested authority to go ahead, though always within the framework of its own instructions.

56. An exception can be made for the area of Rawalpindi. Here PADA should prepare the master programme and the master plan, as well as designing everything that has to be built by the Government, but may authorize the municipal authority or any special body within Rawalpindi to look after the implementation of these special plans.

57. For the purposes of the present report the following definitions are employed:

a. The Region

By this is meant the Federal Region as already decided by the Federal Capital Commission.

This region is sub-divided into:

a. The Metropolitan area.
b. The rural areas outside of it.
c. Special urban functions within the rural area, such as satellites, villages, etc.

b. The Metropolitan Area

The metropolitan area consists of:

a. Islamabad, the capital itself.
b. Rawalpindi and its surrounding cantonments, etc.
c. The National Park with all related functions.

c. Islamabad

Islamabad itself consists of:

a. The frame of the city, main highways, roundabouts, transportation system.
b. Communities and housing
c. The administrative functions.

58. A considerable group of settlements will have to be removed from the Islamabad site. Where will their population settle, where will new agricultural land be found for them, and how many will become citizens of urban areas? What will the related social problems be?

59. Another question refers to the settlements surrounding the urban nucleus of the Federal region. Their rural population will be engaged in vegetable-gardening for the supply of the urban population. But are the fields suitable for vegetable-gardening? What kind and size of irrigation projects are necessary for this function? How many people will be engaged? What will the economic and social effects be? What will the water requirements be, and what are the dangers as far as sufficiency of water is concerned?

60. In Chandigarh the absence of proper regional management brought slum areas and shanty settlements into being outside the boundary of the new town itself. This danger should not be overlooked; it could only too easily arise in the present case tomorrow since its origin lies in the laws of physical development of human settlements. In Brasilia we can already see the development of satellite towns outside the boundaries of the city limits. Private developments are not being directed through a regional programme and plan.

61. Through the regional study it may be found that it is necessary to expand the limits of the Federal region to a radius of several tens of miles, say 40 or 50 miles or more, in order to control all eventualities. At present the boundaries of the Federal area are accepted as they have been determined and decided and the preparation of a regional programme and plan is strongly recommended.

62. The land in the area has been exposed to erosion for a very lengthy period of time. No anti-erosion plans have been applied for years. Manuring has been insufficient, chemical fertilizers inadequate. In some cases there has been an uneconomic utilization of land, i. e. very steeply-sloping areas have been brought under agriculture, whereas others with a gradual slope have been put under forests, all these practices having resulted in a deterioration of the land.

63. An important and large-scale project under construction at this moment in the Metropolitan area, the Rawal Dam, will modify the physical landscape.

64. One of the most typical features of the landscape is the Grand Trunk Road, running through the city of Rawalpindi. Thus the new Capital will be linked by road with Kabul, Teheran, Delhi and East Pakistan, with a branch road to China and Central Asia.

65. Close by runs the railway which, connects Rawalpindi with Delhi, as extention to East Pakistan. The line linking West Pakistan with part of Iran through the Bolan Pass via Quetta, Nushki and Mirjawa, goes on to Zahidan and at Rohri joins the main Karachi-Peshawar railway.

METROPOLITAN PLANNING POLICIES

66. Clearly and convincingly the Northern boundaries of the Capital area should be the hills of the area of Margala. By keeping the same principle of considering the hills as the natural boundary. The expansion of the West can include the whole plain South of the hills until the area containing the Nicholson Monument is reached which is a very natural boundary.

67. On the Northeastern side the boundary can be fixed approximately in a line running vertical to the Murree hills. To the Southeast it may be assumed for the present that the boundary is going to be the Ling River. In the South West, from the Nicholson Monument Pass through Rawalpindi down to the junction of the Grand Trunk Road and the railway, the area is not enclosed by a boundary.

68. Capital area is connected to the Grand Trunk Road by the Rawalpindi-Murree road which branches off in the heart of Rawalpindi town. As a result, the site of the Capital can be approached only through a very congested area. A widening of this road would not solve the problem, since it passes through Rawalpindi town which is densely populated. This would mean a very expensive and very poor solution.

69. This leads to the conclusion that a by-pass outside the limits of Rawalpindi, between Rawalpindi and the Capital, is unavoidable. Since this road will handle high-speed traffic, it should not traverse the site of the Capital or the settlement of Rawalpindi. It should therefore form a dividing zone between the Federal Capital and Rawalpindi town.

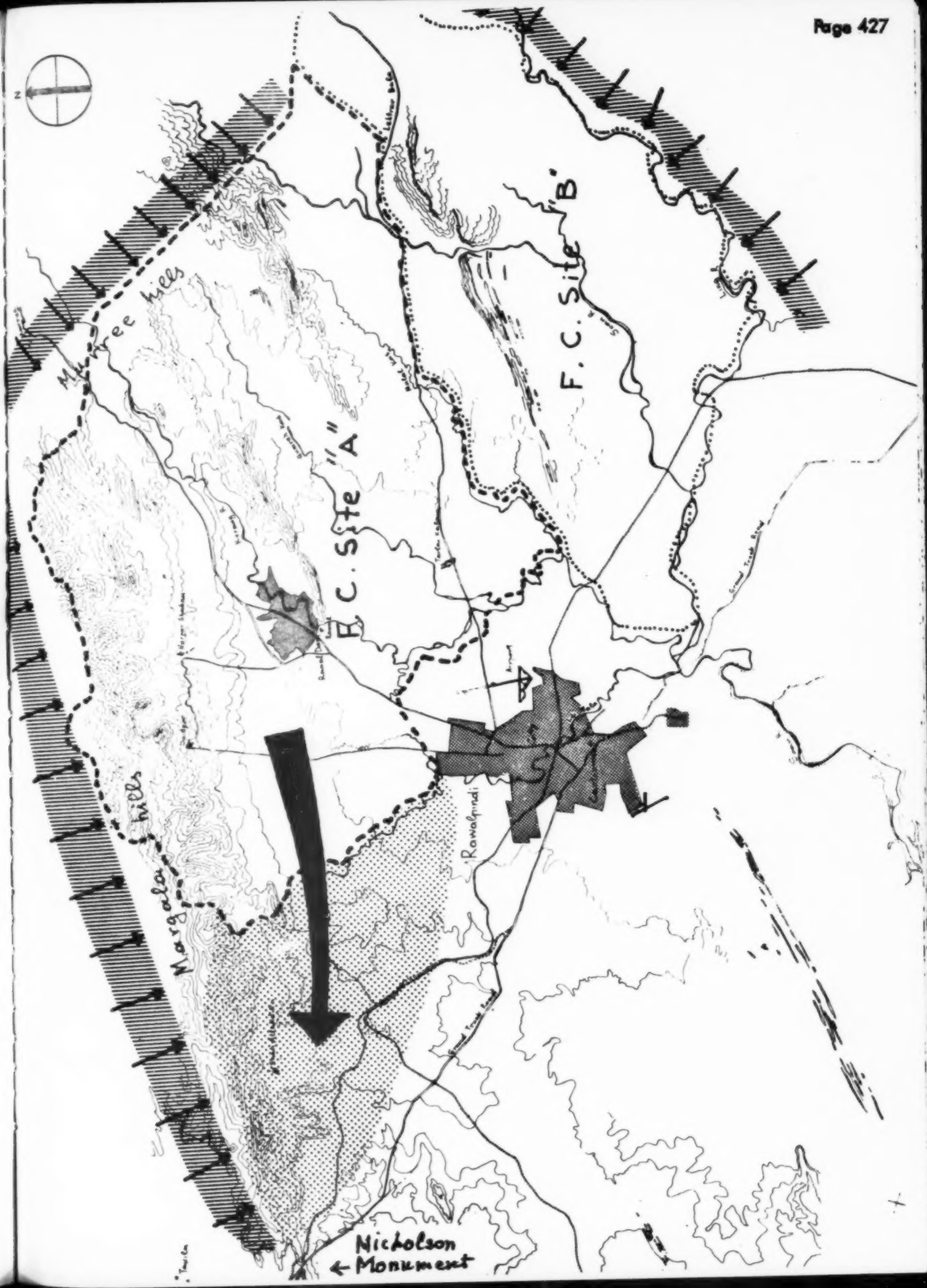
70. The detailed study of the landscape shows convincingly that its basic features impose some basic lines in planning. These are:

a. The direction of the hills, which imposes the locations of the green free areas of the city.

b. The direction of the valleys, which imposes the direction of the main highways of the Capital area.

c. The national and international line of the Grand Trunk Road, with its new branches, which impose a certain pattern as to the connections of the Capital with the remaining part of the country and the world.

71. All free and green areas should, beyond doubt, follow the lines of the hills. Hills cannot easily be built on, and they can become excellent areas for parks gardens, monuments and special facilities for relaxation. They can also contribute towards creating a beneficial microclimate because, if properly planted, they will create currents of cool air in the hot days of summer which will greatly facilitate the ventilation and cooling of the whole area.


F. C. Site "A"
F. C. Site "B"
Murree hills
Margalla hills
Rawalpindi
Nicholson
← Monument

72. There is no question also about the need to have the basic axes approximately following the valleys between the hills. It is natural to have the highways at the deepest line of the landscape. People, cars, traffic will move freely towards this natural line of flow. This also helps enormously in the construction of community facilities. Sewage and drainage systems can be constructed in a most economic way.

73. The analysis carried out up to now has led to the conclusion that there is:

a. A pattern emanating from the existence of the Grand Trunk Road and the need to have two by-passes, one to the North and one to the South of Rawalpindi.

b. A system imposed by the structure of the landscape. This system will have to consist of three axes running approximately parallel of each other and parallel to the hills.

74. After eliminating curves on the basic axes by designing them perpendicular to each other, a rational design is proceeded to, a design defined by the perpendicular coordinates following the directions of the axes of the landscape, i.e. the north-east to south-west and north-west to south-east.

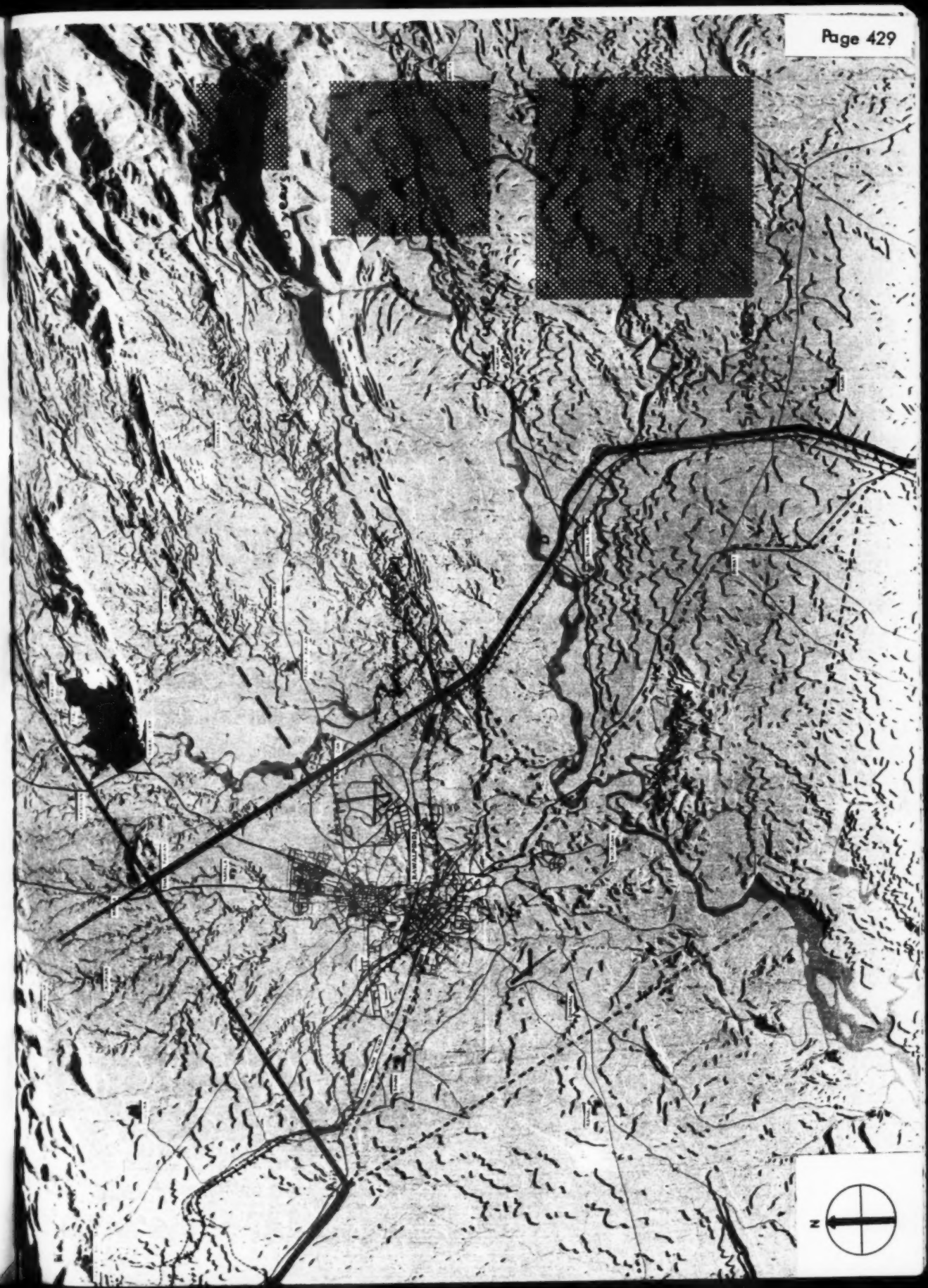
75. The system of coordinates, in accordance with the ideas as defined above, allows consideration of a grid system which will form the main network of the Metropolitan region. The dimensions of the road grid system must be subject to the needs of a rational organization of the area into communities of various classes. The evaluation and importance of certain of these roads will be determined following the complete and detailed analysis which will have to be made before final proposals are reaches.

76. Here it is necessary to stop for a moment and question whether the method proposed here, to follow a pattern of straight and vertical axes, is a proper one.

a. Theoretically it guarantees the best development of an urban area.

b. The landscape itself lends itself very much to the development of such a system of axes.

c. Vehicles developing ever-higher speed will require straight roads with clear cut, well-defined crossings.


N

d. Finally, for cultural reasons Islamabad, a symbolic city of Islam, cannot abstain from the rules of design and synthesis which are characteristics chiefly of Islamic culture. Every large and important synthesis of Islamic culture is based on pure geometry. We only have to think of the great mosques with their squares, of large palaces with their squares, of Fatehpur Sikri and its synthesis on the basis of vertical axes, of the fort of Lahore, or the fort of Delhi, to be reminded that Islamic culture always designed with pure geometry. Even if we go to the smallest details in Islamic culture, we shall find that basically geometry gives the pattern right down to the decoration.

77. The problem of serving both the Metropolitan Area and Islamabad with railways is one of the interesting and important problems of transportation within this area. As a result of analytical research several solutions were arrived at the fourth of which is here recommended. This has the following advantages and disadvantages.

78. Advantages

a. The railway line does not cut through Rawalpindi and the problems of splitting of the town in two, passing of the railway line over the roads, the need to construct overhead bridges for the main roads at least, etc., have been eliminated.

b. Two new stations are situated on the same line in sequence, so that the trains would be able to stop alternatively at either one of them.

c. The station for Islamabad is situated at a relatively short distance from the centre of the town, i.e. approximately 3.5 miles.

The disadvantages of this solution are:

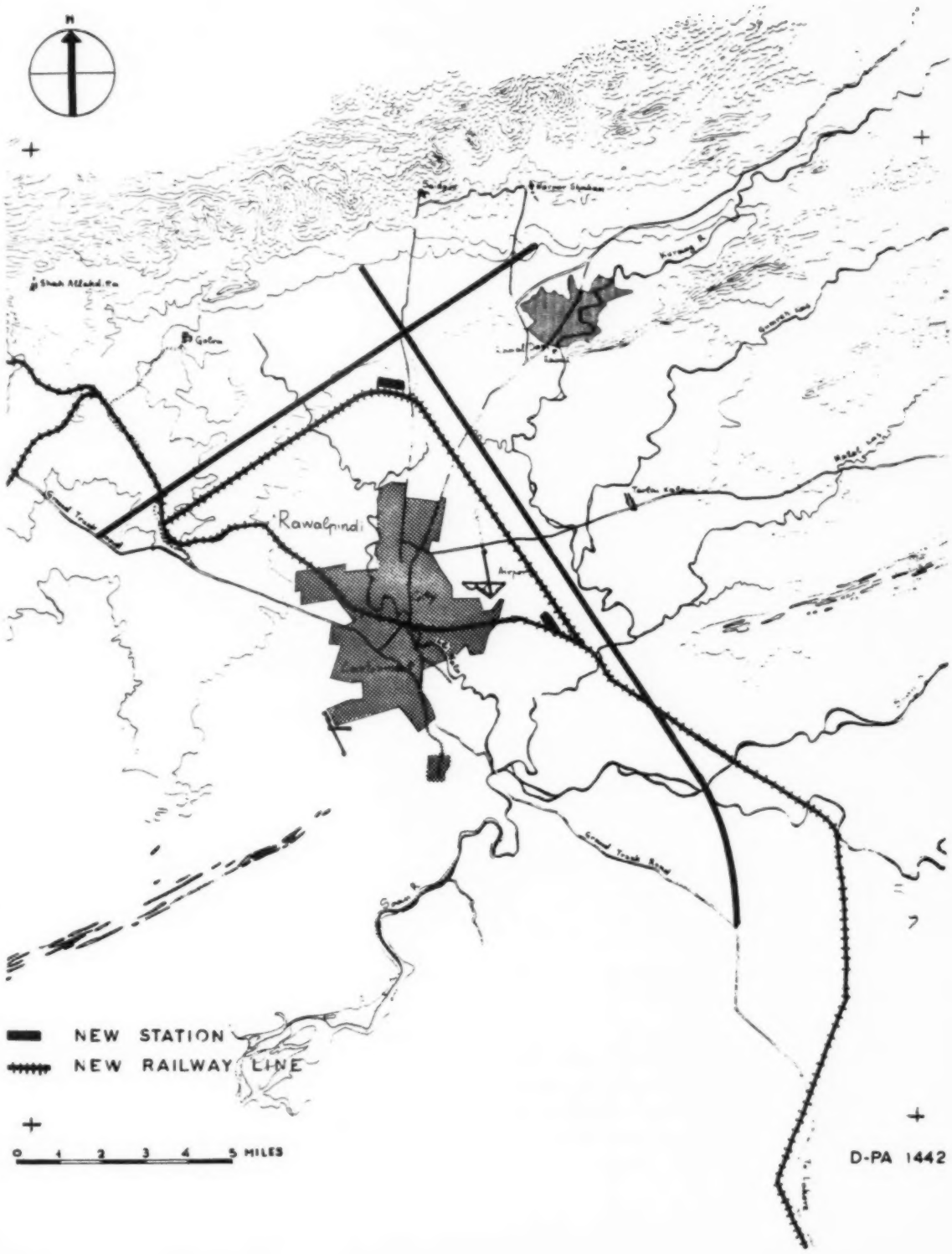
a. The costs involved are high: besides the construction of a new line approximately 15 miles long, two new stations will have to be erected.

b. Rawalpindi Station is at a distance of approximately 5 miles from the centre of the town.

c. It will be necessary to construct overhead bridges for the main roads.

LOCATION OF ISLAMABAD RAILWAY STATION

FORTH SOLUTION



ISLAMABAD PLANNING POLICY

79. A static Capital, especially of a minor size, could be built in any of the four sectors created by the system of axes already mentioned. It would be built North of AB, North of BC, in the sectors CBEF, or in the sector FEGH.

80. Within sectors CBDF and FEGH combined a capital could be created of up to 900,000 population, but no more, and the only area where the Federal Capital would be free to grow over the years, appears to be the area between axis ABC and the hills. This sector would allow the creation of a Capital of over a million and a half people.

81. This area has also other advantages. It comes closer to the most beautiful landscape and this area is not crossed by any highway of the system. However, it is served in the best possible manner by all highways.

82. A delicate problem is how to avoid making the Capital appear too scattered in its years and yet enable it to have plenty of room for later expansion. This problem can be solved by lineal expansion - Dynapolis - to the south west.

83. The administrative functions can be close to the hills and expand always at the foot of the hills, whilst housing and other residential area facilities can cover the area between the hills and highway ABC. Such a scheme will provide for simultaneous growth of administrative facilities over the years as well as for corresponding residential and other areas.

84. By placing Islamabad within the narrow area of the triangle near the hills, in the initial stages of its development, it will find itself lying in its natural scale, i.e. within the scale of the landscape. As the city expands westwards, its scale will also expand proportionately with the scale of the landscape. This means that at each stage of the development of the city, the proportionately-necessary space will be available. Thus the fate of similar cities which have been lost in the landscpae during the first years of their development, will be avoided.

RAWALPINDI PLANNING POLICY

85. The development of Rawalpindi must be directed in the same manner as that of Islamabad, since it forms part of the Metropolitan area. If this development is not directed carefully, the results may be extremely unsatisfactory not only for Rawalpindi but also for Islamabad and the whole of the Metropolitan area. Rawalpindi should not have any Federal role. It should remain:

Somme R.
Highway
Tramway
Tramway

a. The regional centre

b. The servicing area of the Federal Capital. It will include the transportation facilities and all functions which do not coincide with the conception of the Federal Capital as a Federal Administrative Centre and a symbol of the country.

THE MASTER PLAN

86. The 4 main highways must have a width of 1,200 ft. in order to guarantee provision for all the lines of transportation and communication which may be necessary now or in the future, such as main electric transmission lines, main telephone lines and all eventual new types of lines necessary in the future, whether above or under the ground. This width will also make it possible to isolate the nearby areas from the traffic and its noise and nuisance with elongated green belts.

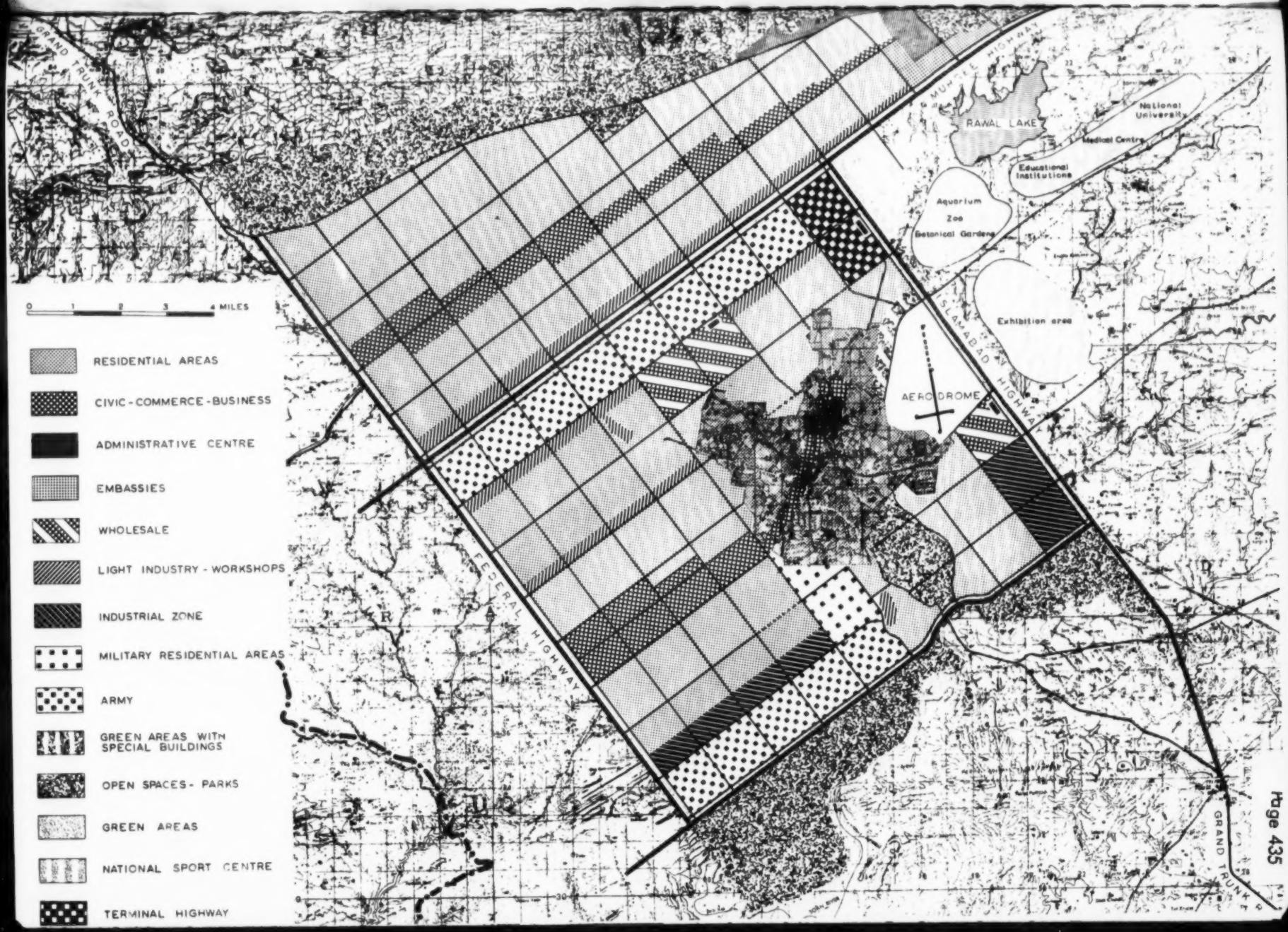
87. All the main roads serving the Metropolitan area form a grid system of axes with a modulus of 2,000 yards, with the exception of such areas where the landscape and the existing conditions of the town of Rawalpindi make it impracticable. Every major square, if it is a residential area, can have a population of 30-50,000 inhabitants.

88. The industrial sector and other facilities should lie on Murree Road, which is the main transportation line, on the other side of the residential sector, so that it will be equally accessible from points outside the city for goods, and from inside the city for services and employment.

89. Thus, the whole of Islamabad is conceived as a city growing along its main axis, with simultaneous development of administration, residence and other functions and places of employment.

90. The residential sector, which will widen as the city grows will contain a central core including shopping, cultural installations like theatres, etc., local administration, and institutions of local importance for the population of Islamabad.

91. On the basis of these principles that the city will be developed with the residential sector, the central core of the city and the industrial sector moving always outwards towards the southwest. The administrative sector will move along the national highway towards the hills and then parallel to the other functions along the hills to the southwest and to the northeast for the military headquarters. The cultural sector which will be on the national highway, will be developed to the northeast for the military headquarters. The cultural sector which will be on the national highway, will be developed to the northeast in order to cover first the part of the Capital area assigned to it, and then farther up in case the cultural centre acquires greater importance.


GRAND TRUNK ROAD
MURREE HIGHWAY
RAWAL LAKE
National University
Medical Centre
Educational Institutions
Aquarium
Zoo
Botanical Gardens
Exhibition area
ISLAMABAD HIGHWAY
AERODROME
FEDERAL HIGHWAY
GRAND TRUNK ROAD
0 1 2 3 4 MILES
RESIDENTIAL AREAS
CIVIC - COMMERCE - BUSINESS
ADMINISTRATIVE CENTRE
EMBASSIES
WHOLESALE
LIGHT INDUSTRY - WORKSHOPS
INDUSTRIAL ZONE
MILITARY RESIDENTIAL AREAS
ARMY
GREEN AREAS WITH SPECIAL BUILDINGS
OPEN SPACES - PARKS
GREEN AREAS
NATIONAL SPORT CENTRE
TERMINAL HIGHWAY

92. The land use within Islamabad will be:

a. Capital and Legislative area.

b. Administrative area, north of the Capital area, forming the northern part of the whole of Islamabad.

c. Judicial area, south of the Capitol, within the Capitol sector.

d. Diplomatic Missions area, surrounding the southern part of the Capitol area.

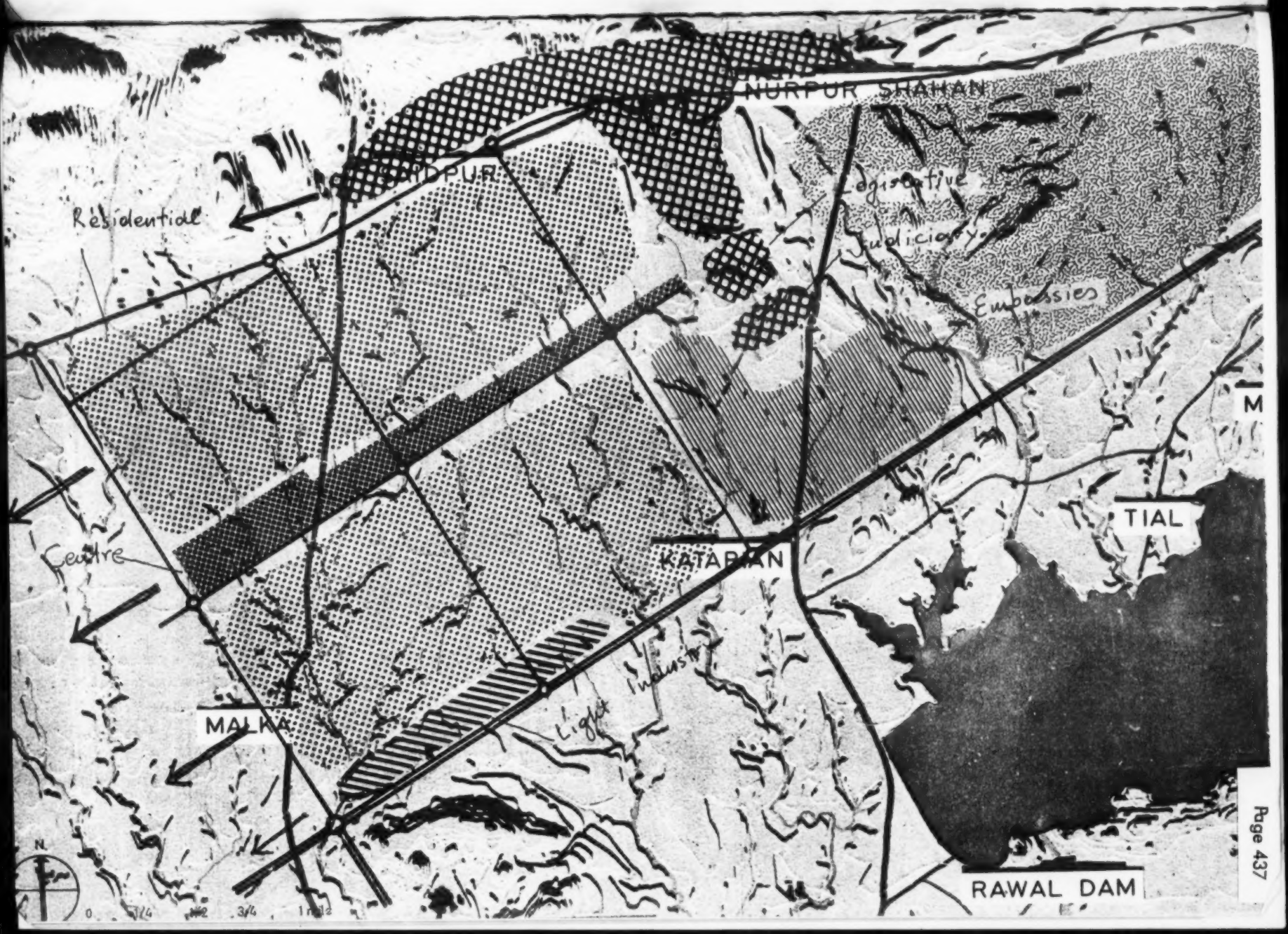
e. Residential areas.

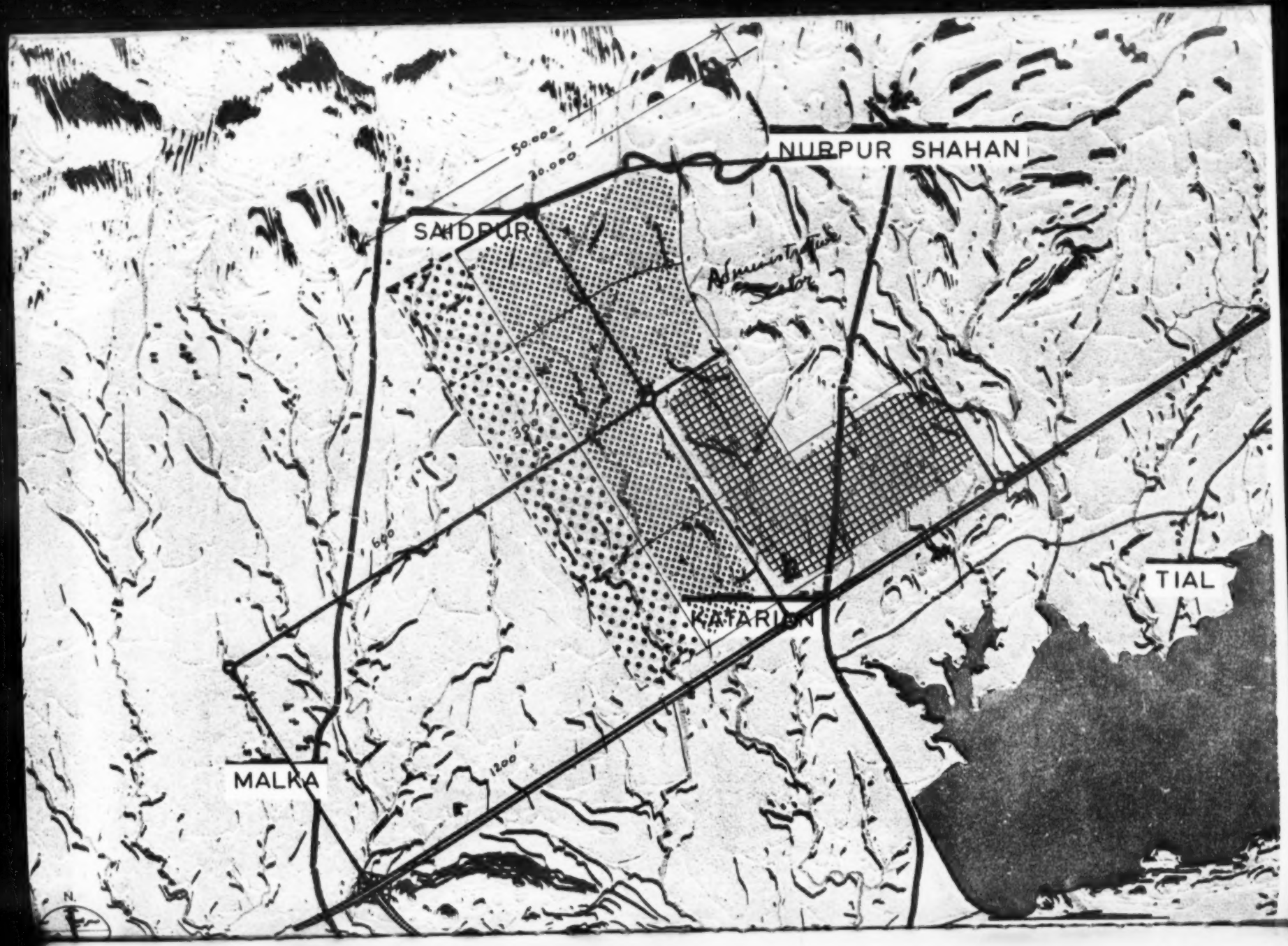
f. Central core of the city.

g. Industrial area, along the Murree Hills. This contains only very light industry and handicraft areascwhich provide servicing industries indispensable for the normal life of the city such as laundries, repair industries, bakeries, etc.

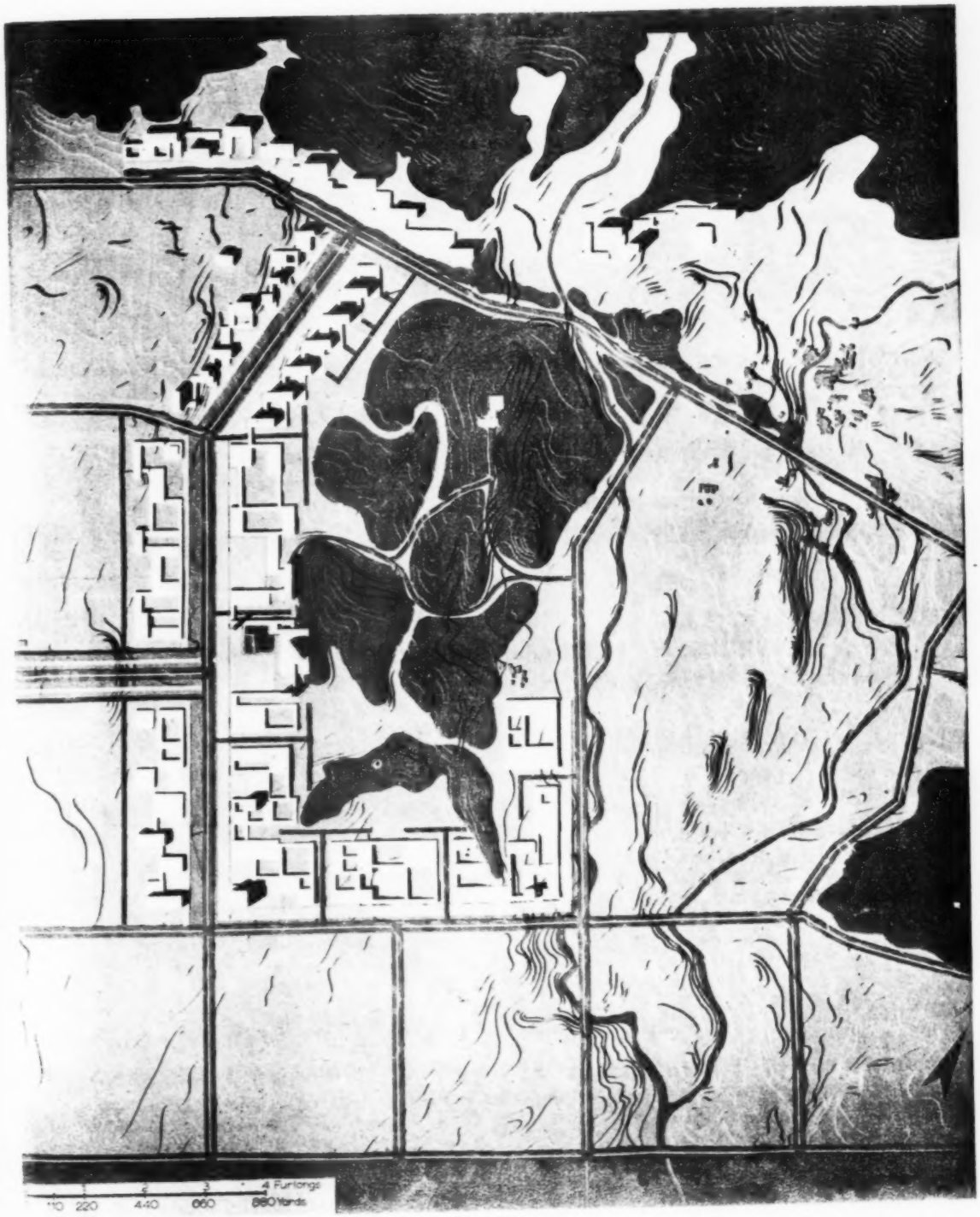
h. A park, extending north-east of the Capitol area, and able to accommodate the expansion of the cultural centre and other important functions of the city.

93. The whole Capitol area will actually be a small community in itself, since it is to contain very special buildings and only a few residences. The same is the case for the community of the diplomatic corps.


NURPUR SHAHAN
Residential
Legislative
Judiciary
Embassies
KATARIAN
TIAL
Centre
MALKA
Indus
Light
RAWAL DAM
N


NURPUR SHAHAN
SAIDPUR
50.000
30.000
Administrative
Sector
KATARIAN
TIAL
MALKA
600
1200
N

THE ADMINISTRATIVE SECTOR



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